



CONTRACT FOR SERVICES

THIS CONTRACT is made on _____, 20____, by and between the CITY OF LINCOLN ("City"), and _____ ("Consultant/Contractor").

WITNESSETH:

WHEREAS, the City [proposes][desires] _____;

WHEREAS, the Consultant/Contractor has presented a proposal for such services to the City, dated _____, 20____, attached hereto and incorporated herein as **Exhibit A**, and is duly licensed, qualified and experienced to perform those services;

NOW, THEREFORE, the parties hereto mutually agree as follows:

1. SCOPE OF SERVICES:

A. Consultant/Contractor shall do all work, attend all meetings, produce all reports and carry out all activities necessary for the completion of the services described in **Exhibit A** ("Scope of Work"). This Contract and its exhibits shall be known as the "Contract Documents." Terms set forth in any Contract Document shall be deemed to be incorporated in all Contract Documents as if set forth in full therein. In the event of conflict between terms contained in these Contract Documents, the more specific term shall control. If any portion of the Contract Documents shall be in conflict with any other portion, provisions contained in the Contract shall govern over conflicting provisions contained in the exhibits to the Contract.

B. Consultant/Contractor enters into this Contract as an independent contractor and not as an employee of the City. The Consultant/Contractor shall have no power or authority by this Contract to bind the City in any respect. Nothing in this Contract shall be construed to be inconsistent with this relationship or status. All employees, agents, contractors or subcontractors hired or retained by the Consultant/Contractor are employees, agents, contractors or subcontractors of the Consultant/Contractor and not of the City. The City shall not be obligated in any way to pay any wage claims or other claims made against Consultant/Contractor by any such employees, agents, contractors or subcontractors, or any other person resulting from performance of this Contract.

C. The Consultant/Contractor agrees it has satisfied itself by its own investigation and research regarding the conditions affecting the work to be done and labor and materials needed, and that its decision to execute this Contract is based on such independent investigation and research.

2. TERM OF CONTRACT:





A. The services of Consultant/Contractor are to commence upon [execution of this Contract by] **OR** [receipt of written notice to proceed from] the City, and shall be undertaken and completed in accordance with the Schedule of Performance, attached hereto and incorporated herein by this reference as **Exhibit B**.

B. Consultant/Contractor's failure to complete work in accordance with the Schedule of Performance may result in delayed compensation as described in Section 3.

C. The City Manager or his or her designee may, by written instrument signed by the Parties, extend the duration of this Contract for [a period of _____] **OR** [a period equal to the original term of this Contract] in the manner provided in Section 5, provided that the extension does not require the payment of compensation in excess of the maximum compensation set forth in Section 3, Compensation.

3. COMPENSATION:

A. The Consultant/Contractor shall be paid [monthly] [at the completion of services] for the actual fees, costs and expenses [for all time and materials required and expended, but in no event shall total compensation exceed _____ (\$_____), without City's prior written approval]. Account Code Number/Account Description for Scope of Work to be charged to: _____.

B. Said amount shall be paid upon submittal of a [final] [monthly] [other] billing [showing completion of the tasks that month]. Consultant/Contractor shall furnish City with invoices for all expenses as well as for all materials authorized by this Contract. The invoices shall be submitted with the [final] [monthly] [other] billings. If Consultant/Contractor's performance is not in conformity with the Schedule of Performance, payments may be delayed or denied, unless the Consultant/Contractor's failure to perform in conformity with the Schedule of Performance is a documented result of the City's failure to conform to the Schedule of Performance, or if the Schedule of Performance is extended pursuant to Section 5.

C. If the work is halted at the request of the City, compensation shall be based upon the proportion that the work performed bears to the total work required by this Contract, subject to Section 4.

4. TERMINATION:

A. This Contract may be terminated by either party, provided that the other party is given not less than [_____] calendar days' written notice (delivered by certified mail, return receipt requested) of intent to terminate.

B. The City may temporarily suspend this Contract, at no additional cost to City, provided that the Consultant/Contractor is given written notice (delivered by certified mail, return receipt requested) of temporary suspension. If City gives such notice of temporary suspension, Consultant/Contractor shall immediately suspend its activities under this Contract.



C. Notwithstanding any provisions of this Contract, Consultant/Contractor shall not be relieved of liability to the City for damages sustained by the City by virtue of any breach of this Contract by Consultant/Contractor, and the City may withhold any payments due to Consultant/Contractor until such time as the exact amount of damages, if any, due the City from Consultant/Contractor is determined.

D. In the event of termination, the Consultant/Contractor shall be compensated as provided for in this Contract, except as provided in Section 4.C. Upon termination, the City shall be entitled to all work, including, but not limited to, appraisals, inventories, studies, analyses, drawings and data estimates performed to that date in accordance with Section 7 hereof.

5. AMENDMENTS, CHANGES OR MODIFICATIONS:

Amendments, changes or modifications in the terms of this Contract may be made at any time by mutual written agreement between the parties hereto and shall be signed by the persons authorized to bind the parties hereto.

6. EXTENSIONS OF TIME:

Consultant/Contractor may, for good cause, request extensions of time to perform the services required hereunder. Such extensions shall be authorized in advance by the City in writing and shall be incorporated in written amendments to this Contract or the attached Scope of Work in the manner provided in Section 5.

7. PROPERTY OF CITY:

A. It is mutually agreed that all materials prepared by the Consultant/Contractor under this Contract shall become the property of the City, and the Consultant/Contractor shall have no property right therein whatsoever. Immediately upon termination, the City shall be entitled to, and the Consultant/Contractor shall deliver to the City, all data, drawings, specifications, reports, estimates, summaries and other such materials as may have been prepared or accumulated to date by the Consultant/Contractor in performing this Contract which is not Consultant/Contractor's privileged information, as defined by law, or Consultant/Contractor's personnel information, along with all other property belonging exclusively to the City which is in the Consultant/Contractor's possession.

B. Additionally, it is agreed that the parties intend this to be a contract for services and each considers the products and results of the services to be rendered by Consultant/Contractor hereunder (the "Work") to be a work made for hire. Consultant/Contractor acknowledges and agrees that the Work (and all rights therein, including, without limitation, copyright) belongs to and shall be the sole and exclusive property of the City.

8. COMPLIANCE WITH ALL LAWS; PREVAILING WAGES:

A. Consultant/Contractor shall comply with all applicable laws, ordinances, and codes of federal, state and local governments, as applicable, and shall commit no trespass on any public or private property in performing any of the work authorized by this Contract. If necessary, it shall be City's responsibility to obtain all rights of way and easements to enable



Consultant/Contractor to perform its services hereunder. Consultant/Contractor shall assist City in providing the same.

B. Some or all of the work herein may be a “public work” within the meaning of Labor Code section 1720, subject to the payment of prevailing wages under Labor Code sections 1720 et seq. Accordingly, Consultant/Contractor shall cause all such work, as applicable, to be performed as a “public work” in compliance with California prevailing wage laws, including the payment of prevailing wages, as applicable. In the event it is determined that the Consultant/Contractor is required to pay prevailing wages for the work performed under this Agreement, but failed to do so, the Consultant/Contractor shall pay all applicable penalties, costs, fees, wages, and wage differential. To the extent the project is subject to the requirement of payment of prevailing wages pursuant to California Labor Code sections 1720 et seq, then the project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Copies of the prevailing rate of per diem wages are on file at the City’s offices, which shall be made available to any interested party on request. Consultant/Contractor shall cause a copy of the determination of the director of the prevailing rate of per diem wages to be posted at each job site, as well as all related notices required by applicable law and regulation.

9. WARRANTIES AND RESPONSIBILITIES - CONSULTANT/CONTRACTOR:

A. Consultant/Contractor agrees, represents and warrants to City that it has all licenses, permits, qualifications and approvals of whatever nature which are legally required for Consultant/Contractor to practice its profession and to properly provide the services set forth in **Exhibit A** in a manner which is consistent with the generally accepted standards of Consultant/Contractor’s profession. Consultant/Contractor represents and warrants to City that Consultant/Contractor shall, at its sole cost and expense, keep in effect or obtain at all times during the term of this Contract any licenses, permits and approvals which are legally required for Consultant/Contractor to practice its profession at the time the services are performed.

B. Consultant/Contractor agrees and represents that the work performed under this Contract shall be in accordance with applicable federal, state and local law in accordance with Section 17.A hereof.

C. Consultant/Contractor shall designate a project manager who at all times shall represent the Consultant/Contractor before the City on all matters relating to this Contract. In the event that City, in its sole discretion, at any time during the term of this Contract, desires the removal of any person or persons assigned by Consultant/Contractor, including but not limited to the project manager, to perform services pursuant to this Contract, Consultant/Contractor shall remove any such person immediately upon receiving notice from City of the desire of City for the removal of such person or persons.

D. Except as set forth in **Exhibit D**, Consultant/Contractor shall, at its sole cost and expense, furnish all facilities, equipment, and other materials which may be required for furnishing services pursuant to this Agreement. City shall furnish to Consultant/Contractor only the facilities, equipment, and other materials listed in **Exhibit D** according to the terms and conditions set forth in **Exhibit D**.



E. [Consultant/Contractor shall provide corrective services without charge to the City for services which fail to meet the above professional and legal standards and which are reported to Consultant/Contractor in writing within sixty (60) days of discovery. Should Consultant/Contractor fail or refuse to perform promptly its obligations, the City may render or undertake performance thereof and the Consultant/Contractor shall be liable for any expenses thereby incurred.]

10. SUBCONTRACTING:

None of the services covered by this Contract shall be subcontracted without the prior written consent of the City, which will not be unreasonably withheld. Consultant/Contractor shall be as fully responsible to the City for the negligent acts and omissions of its contractors and subcontractors, and of persons either directly or indirectly employed by them, as it is for the negligent acts and omissions of persons directly employed by Consultant/Contractor.

11. ASSIGNABILITY:

Consultant/Contractor shall not assign or transfer any interest in this Contract whether by assignment or novation, without the prior written consent of the City which will not be unreasonably withheld. However, claims for money due or to become due to Consultant/Contractor from the City under this Contract may be assigned to a financial institution or to a trustee in bankruptcy, without such approval. Notice of any assignment or transfer whether voluntary or involuntary shall be furnished promptly to the City.

12. INTEREST IN CONTRACT:

Consultant/Contractor covenants that neither it, nor any of its employees, agents, contractors, subcontractors has any interest, nor shall they acquire any interest, direct or indirect, in the subject of the Contract, nor any other interest which would conflict in any manner or degree with the performance of its services hereunder. Consultant/Contractor shall make all disclosures required by the City's conflict of interest code in accordance with the category designated by the City, unless the City Manager determines in writing that Consultant/Contractor's duties are more limited in scope than is warranted by the category designated by the City code and that a narrower disclosure category should apply. Consultant/Contractor also agrees to make disclosure in compliance with the City conflict of interest code if, at any time after the execution of this Contract, City determines and notifies Consultant/Contractor in writing that Consultant/Contractor's duties under this Contract warrant greater disclosure by Consultant/Contractor than was originally contemplated. Consultant/Contractor shall make disclosures in the time, place and manner set forth in the conflict of interest code and as directed by the City.

13. MATERIALS CONFIDENTIAL:

All of the materials prepared or assembled by Consultant/Contractor pursuant to performance of this Contract are confidential and Consultant/Contractor agrees that they shall not be made available to any individual or organization without the prior written approval of the City, except by court order.



14. LIABILITY OF CONSULTANT/CONTRACTOR-NEGLIGENCE:

Consultant/Contractor shall be responsible for performing the work under this Contract in a manner which is consistent with the generally-accepted standards of the Consultant/Contractor's profession and shall be liable for its own negligence and the negligent acts of its employees, agents, contractors and subcontractors. The City shall have no right of control over the manner in which the work is to be done but only as to its outcome, and shall not be charged with the responsibility of preventing risk to Consultant/Contractor or its employees, agents, contractors or subcontractors.

15. INDEMNITY AND LITIGATION COSTS:

Consultant/Contractor shall indemnify, defend, and hold harmless the City, its officers, officials, agents, and employees and volunteers from and against any and all claims, damages, demands, liability, costs, losses and expenses, including without limitation court costs and reasonable attorneys' fees, arising in any manner by reason of negligent acts or negligent failure to act, recklessness, [errors, omissions] or willful misconduct incident to the performance of this Contract on the part of Consultant/Contractor [except such loss or damage which was caused by the active negligence, sole negligence, or willful misconduct of the City]. The provisions of this paragraph shall survive termination or suspension of this Contract.

16. CONSULTANT/CONTRACTOR TO PROVIDE INSURANCE:

A. Consultant/Contractor shall not commence any work before obtaining, and shall maintain in force at all times during the duration and performance of this Contract the policies of insurance specified in this Section. Such insurance must have the approval of the City as to limit, form, and amount, and shall be placed with insurers with a current A.M. Best's rating of no less than A:VII (or in the case of Worker's Compensation insurance, with the State Compensation Insurance Fund of California).

B. Prior to execution of this Contract and prior to commencement of any work, the Consultant/Contractor shall furnish the City with certificates of insurance and copies of original endorsements providing evidence of coverage for all policies required by the Contract. The endorsements shall be signed by a person authorized by the insurer to bind coverage on its behalf. The Consultant/Contractor agrees to furnish one copy of each required policy to the City, and additional copies as requested in writing, certified by an authorized representative of the insurer. The failure of Consultant/Contractor or of any of its contractors or subcontractors to maintain or renew coverage or to provide evidence of renewal may be treated by the City as a material breach of this Contract. Approval of the insurance by the City shall not relieve or decrease any liability of Consultant/Contractor.

C. In addition to any other remedy the City may have, if Consultant/Contractor fails to maintain the insurance coverage as required in this Section, the City may obtain such insurance coverage as is not being maintained, in form and amount substantially the same as is required herein, and the City may deduct the cost of such insurance from any amounts due or which may become due Consultant/Contractor under this Contract.



D. No policy required by this Contract shall be endorsed to suspended, voided, canceled, terminated by either party, or reduced in coverage or in limits unless the Consultant/Contractor has provided thirty (30) days' prior written notice by certified mail, return receipt requested, to the City.

E. Any deductibles, aggregate limits, pending claims or lawsuits which may diminish the aggregate limits, or self-insured retentions, must be declared to, and approved by, the City.

F. Aggregate Limits/Impairment.

If any of the insurance coverages required by this section contain annual aggregate limits, the Consultant/Contractor must give the City notice of any pending claim or lawsuit which may diminish the aggregate. The Consultant/Contractor must take steps to restore the impaired aggregates or provide replacement insurance protection. The City has the option to specify the minimum acceptable aggregate limit for each line of coverage required. No substantial reductions in scope of coverage which may affect City's protection are allowed without City's prior written consent.

G. The requirement as to types, limits, and the City's approval of insurance coverage to be maintained by Consultant/Contractor are not intended to, and shall not in any manner, limit or qualify the liabilities and obligations assumed by Consultant/Contractor under the Contract.

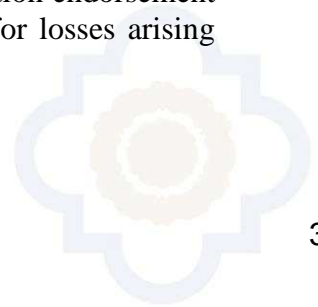
H. The Consultant/Contractor and its contractors and subcontractors shall, at their expense, maintain in effect at all times during the performance of work under the Contract not less than the following coverage and limits of insurance, which shall be maintained with insurers and under forms of policy satisfactory to the City. The maintenance by Consultant/Contractor and its contractors and subcontractors of the following coverage and limits of insurance is a material element of this Contract. The failure of Consultant/Contractor or of any of its contractors or subcontractors to maintain or renew coverage or to provide evidence of renewal may be treated by the City as a material breach of this Contract.

I. Worker's Compensation and Employer's Liability Insurance.

1. Worker's Compensation Insurance to protect the Consultant/Contractor, its contractors and subcontractors from all claims under Worker's Compensation and Employer's Liability Acts, including Longshoremen's and Harbor Worker's Act ("Acts"), if applicable. Such coverage shall be maintained, in type and amount, in strict compliance with all applicable state and federal statutes and regulations. The Consultant/Contractor shall execute a certificate of compliance with Labor Code Section 3700, on the form provided in the Contract Documents.

2. Consultant/Contractor shall provide a Waiver of Subrogation endorsement in favor of the City, its officers, officials, employees, agents and volunteers for losses arising from work performed by the Consultant/Contractor

J. Commercial General Liability Insurance





1. The insurance shall be provided on form CG0001, or its equivalent, and shall include coverage for claims for bodily injury or property damage arising out of premises/operations, products/completed operations, contractual liability, and subconsultant's work and personal and advertising injury resulting from actions, failures to act, or operations of the insured, or by its employees or agents, or by anyone directly or indirectly employed by the insured. The amount of insurance coverage shall not be less than **[\$1,000,000.00]** per occurrence and **[\$2,000,000]** general and products/completed operations aggregates.

2. The commercial general liability insurance shall also include the following:

a. Endorsement equivalent to CG 2010 1185 naming the City, its officers, officials, employees, agents, and volunteers as additional insureds. The endorsement shall contain no special limitations on the scope of protection afforded to the City, its officers, officials, employees or volunteers.

b. Endorsement stating insurance provided to the City shall be primary as respects the City, its officers, officials, employees and any insurance or self insurance maintained by the City, its officers, officials, employees or volunteers shall be in excess of the Consultant's insurance and shall not contribute with it, to the payment or satisfaction of any defense expenses, loss, or judgment.

c. Provision or endorsement stating that the Consultant's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

d. Provision or endorsement stating that any failure to comply with reporting or other provisions of the policies including breaches of representations shall not affect coverage provided to the City, its officers, officials, employees, or volunteers.

e. Provision or endorsement stating that such insurance, subject to all of its other terms and conditions, applies to the liability assumed by the Consultant/Contractor under the Contract, including, without limitation, set forth in Section 15, Indemnity and Litigation Costs.

K. Commercial Automobile Liability Insurance.

1. The commercial automobile liability insurance shall include, but shall not be limited to, protection against claims for death, bodily or personal injury, or property damage for owned, non-owned, and hired automobiles resulting from actions, failures to act, or operations of the insured, or by its employees or agents, or by anyone directly or indirectly employed by the insured. The amount of insurance coverage shall not be less than **[\$1,000,000.00]** per occurrence.

2. The commercial automobile liability insurance shall include the same endorsements as required for Commercial General Liability Insurance (16.J.2 above.)



L. Professional Liability.

The Consultant/Contractor and its contractors and subcontractors shall secure and maintain in full force, during the term of this Contract and for five years thereafter, professional liability insurance policies appropriate to the respective professions and the work to be performed as specified in this Contract. The limits of such professional liability insurance coverage shall not be less than **[\$1,000,000]** per claim.

17. MISCELLANEOUS PROVISIONS:

A. Compliance With Laws. Consultant/Contractor shall keep itself fully informed of, shall observe and comply with, and shall cause any and all persons, firms or corporations employed by it or under its control to observe and comply with, applicable federal, state, county and municipal laws, ordinances, regulations, orders and decrees which in any manner affect those engaged or employed on the work described by this Contract or the materials used or which in any way affect the conduct of the work, including laws relating to prevailing wages pursuant to Labor Code section 1771 et seq.

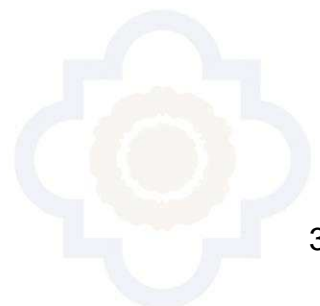
B. Non-Discrimination. Consultant/Contractor shall not engage in unlawful employment discrimination. Such unlawful employment discrimination includes, but is not limited to, employment discrimination based upon a person's race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, gender, citizenship, or sexual orientation. Consultant/Contractor shall comply with Section 122(a) of the State and Local Fiscal Assistance Act of 1972.

C. Inspection of Records. Consultant/Contractor shall maintain and make available for inspection by the City and its auditors accurate records of all of its costs, disbursements and receipts with respect to any work under this Contract. Such inspections may be made during regular office hours at any time until six (6) months after the final payments under this Contract are made to the Consultant/Contractor.

D. Entirety of Agreement. This Contract constitutes the entire agreement between the parties relative to the services specified herein and no modification hereof shall be effective unless and until such modification is evidenced by a writing signed by both parties to this Contract. There are no understandings, agreements, conditions, representations, warranties or promises, with respect to this Contract, except those contained in or referred to in the writing.

E. Notices. All notices that are required to be given by one party to the other under this Contract shall be in writing and shall be deemed to have been given if delivered personally or enclosed in a properly addressed envelope and deposited in a United States Post Office for delivery by registered or certified mail addressed to the parties at the following addresses:

CITY: Attn: City Manager
600 Sixth Street
Lincoln, CA 95648





CONSULTANT/CONTRACTOR: Attn:
Address line 1
Address line 2

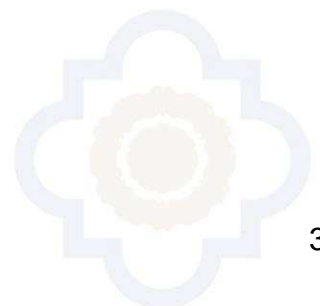
F. Governing Law. This Contract shall be interpreted and governed by the laws of the State of California.

G. Venue. Any action arising out of this Contract shall be brought in Placer County, California, regardless of where else venue may lie.

H. Attorneys' Fees. In any action brought by either party to enforce the terms of this Contract, each party shall be bear responsibility for its attorney's fees and all costs regardless of whether one party is determined to be the prevailing party.

I. Counterparts. The parties may execute this Contract in two or more counterparts, which shall, in the aggregate, be signed by all the parties, each counterpart shall be deemed an original instrument as against any party who has signed it.

J. Severability. If any term, provision, covenant, or condition of this Contract is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the Contract shall remain in full force and effect and shall in no way be affected, impaired, or invalidated.





NAME/COMPANY/ADDRESS

CITY OF LINCOLN,
a municipal corporation

(Authorized Signature)

Matthew Brower, City Manager

Print Name

Dated

APPROVED AS TO FORM:

Jonathan Hobbs, City Attorney

Dated

ATTEST:

City Clerk

Dated

City Accountability:

Department responsible for contract:

Staff responsible for contract:

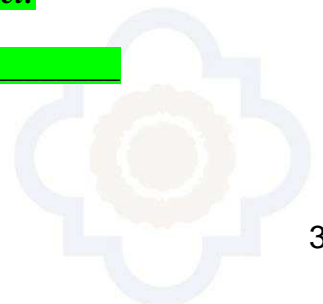




EXHIBIT A

SCOPE OF WORK

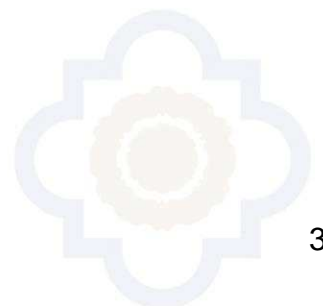




EXHIBIT B

SCHEDULE OF PERFORMANCE

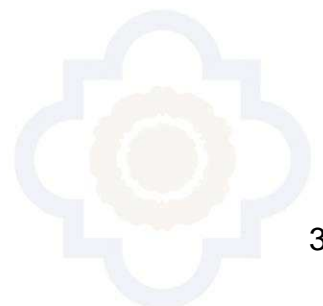




EXHIBIT C

CERTIFICATE OF COMPLIANCE WITH LABOR CODE § 3700 Labor Code § 1861

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

CONSULTANT/CONTRACTOR

By: _____
Title

Print Name

Date

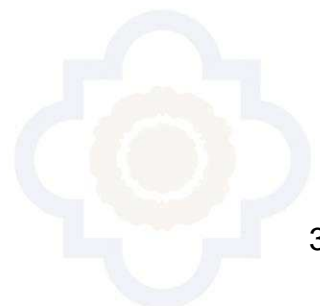
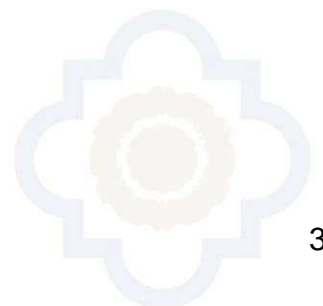




EXHIBIT D

FACILITIES, EQUIPMENT, OTHER MATERIALS

Consultant/Contractor shall be responsible for providing all necessary facilities, equipment and personnel to undertake the necessary task(s) outlined in **Exhibit A**.





CONTRACT FOR SERVICES

THIS CONTRACT is made on September 13, 2016 by and between the CITY OF LINCOLN ("City"), and ATC Group Services, LLC ("Consultant/Contractor").

WITNESSETH:

WHEREAS, the City desires a contract with ATC Group Services, LLC to provide consulting services for the Closed Lincoln Landfill Ongoing Monitoring and Maintenance Project for a three-year period, beginning FY 2016/2017 (September 13, 2016) and ending FY 2019/2020 (September 13, 2019), with the option to extend the contract for one additional three-year term, for a total contract amount not to exceed \$135,852 (10% contingency included).

WHEREAS, the Consultant/Contractor has presented a proposal for such services to the City, dated May 27, 2016, attached hereto and incorporated herein as **Exhibit A**, and is duly licensed, qualified and experienced to perform those services;

NOW, THEREFORE, the parties hereto mutually agree as follows:

1. SCOPE OF SERVICES:

A. Consultant/Contractor shall do all work, attend all meetings, produce all reports and carry out all activities necessary for the completion of the services described in **Exhibit A** ("Scope of Work"). This Contract and its exhibits shall be known as the "Contract Documents." Terms set forth in any Contract Document shall be deemed to be incorporated in all Contract Documents as if set forth in full therein. In the event of conflict between terms contained in these Contract Documents, the more specific term shall control. If any portion of the Contract Documents shall be in conflict with any other portion, provisions contained in the Contract shall govern over conflicting provisions contained in the exhibits to the Contract.

B. Consultant/Contractor enters into this Contract as an independent contractor and not as an employee of the City. The Consultant/Contractor shall have no power or authority by this Contract to bind the City in any respect. Nothing in this Contract shall be construed to be inconsistent with this relationship or status. All employees, agents, contractors or subcontractors hired or retained by the Consultant/Contractor are employees, agents, contractors or subcontractors of the Consultant/Contractor and not of the City. The City shall not be obligated in any way to pay any wage claims or other claims made against Consultant/Contractor by any such employees, agents, contractors or subcontractors, or any other person resulting from performance of this Contract.

C. The Consultant/Contractor agrees it has satisfied itself by its own investigation and research regarding the conditions affecting the work to be done and labor and materials needed, and that its decision to execute this Contract is based on such independent investigation and research.



2. TERM OF CONTRACT:

A. The services of Consultant/Contractor are to commence upon execution of this Contract the City, and shall be undertaken and completed in accordance with the Schedule of Performance, attached hereto and incorporated herein by this reference as **Exhibit B**.

B. Consultant/Contractor's failure to complete work in accordance with the Schedule of Performance may result in delayed compensation as described in Section 3.

C. The City Manager or his or her designee may, by written instrument signed by the Parties, extend the duration of this Contract for a period equal to the original term of this Contract in the manner provided in Section 5, provided that the extension does not require the payment of compensation in excess of the maximum compensation set forth in Section 3, Compensation.

3. COMPENSATION:

A. The Consultant/Contractor shall be paid at the completion of services for the actual fees, costs and expenses for all time and materials required and expended, but in no event shall total compensation exceed \$135,852 (10% contingency included) for a three-year period (ending September 13, 2019) without City's prior written approval. The Scope of Work shall be charged to the Solid Waste Fund/Professional Services Account Fund: 730-6865-50400-0349.

B. Said amount shall be paid upon submittal of a monthly billing showing completion of the tasks that month. Consultant/Contractor shall furnish City with invoices for all expenses as well as for all materials authorized by this Contract. The invoices shall be submitted with the monthly billing. If Consultant/Contractor's performance is not in conformity with the Schedule of Performance, payments may be delayed or denied, unless the Consultant/Contractor's failure to perform in conformity with the Schedule of Performance is a documented result of the City's failure to conform to the Schedule of Performance, or if the Schedule of Performance is extended pursuant to Section 5.

C. If the work is halted at the request of the City, compensation shall be based upon the proportion that the work performed bears to the total work required by this Contract, subject to Section 4.

4. TERMINATION:

A. This Contract may be terminated by either party, provided that the other party is given not less than 30 calendar days' written notice (delivered by certified mail, return receipt requested) of intent to terminate.

B. The City may temporarily suspend this Contract, at no additional cost to City, provided that the Consultant/Contractor is given written notice (delivered by certified mail, return receipt requested) of temporary suspension. If City gives such notice of temporary suspension, Consultant/Contractor shall immediately suspend its activities under this Contract.



C. Notwithstanding any provisions of this Contract, Consultant/Contractor shall not be relieved of liability to the City for damages sustained by the City by virtue of any breach of this Contract by Consultant/Contractor, and the City may withhold any payments due to Consultant/Contractor until such time as the exact amount of damages, if any, due the City from Consultant/Contractor is determined.

D. In the event of termination, the Consultant/Contractor shall be compensated as provided for in this Contract, except as provided in Section 4.C. Upon termination, the City shall be entitled to all work, including, but not limited to, appraisals, inventories, studies, analyses, drawings and data estimates performed to that date in accordance with Section 7 hereof.

5. AMENDMENTS, CHANGES OR MODIFICATIONS:

Amendments, changes or modifications in the terms of this Contract may be made at any time by mutual written agreement between the parties hereto and shall be signed by the persons authorized to bind the parties hereto.

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Consultant/Contractor may, for good cause, request extensions of time to perform the services required hereunder. Such extensions shall be authorized in advance by the City in writing and shall be incorporated in written amendments to this Contract or the attached Scope of Work in the manner provided in Section 5.

7. PROPERTY OF CITY:

A. It is mutually agreed that all materials prepared by the Consultant/Contractor under this Contract shall become the property of the City, and the Consultant/Contractor shall have no property right therein whatsoever. Immediately upon termination, the City shall be entitled to, and the Consultant/Contractor shall deliver to the City, all data, drawings, specifications, reports, estimates, summaries and other such materials as may have been prepared or accumulated to date by the Consultant/Contractor in performing this Contract which is not Consultant/Contractor's privileged information, as defined by law, or Consultant/Contractor's personnel information, along with all other property belonging exclusively to the City which is in the Consultant/Contractor's possession.

B. Additionally, it is agreed that the parties intend this to be a contract for services and each considers the products and results of the services to be rendered by Consultant/Contractor hereunder (the "Work") to be a work made for hire. Consultant/Contractor acknowledges and agrees that the Work (and all rights therein, including, without limitation, copyright) belongs to and shall be the sole and exclusive property of the City.

8. COMPLIANCE WITH ALL LAWS; PREVAILING WAGES:



A. Consultant/Contractor shall comply with all applicable laws, ordinances, and codes of federal, state and local governments, as applicable, and shall commit no trespass on any public or private property in performing any of the work authorized by this Contract. If necessary, it shall be City's responsibility to obtain all rights of way and easements to enable Consultant/Contractor to perform its services hereunder. Consultant/Contractor shall assist City in providing the same.

B. Some or all of the work herein may be a "public work" within the meaning of Labor Code section 1720, subject to the payment of prevailing wages under Labor Code sections 1720 et seq. Accordingly, Consultant/Contractor shall cause all such work, as applicable, to be performed as a "public work" in compliance with California prevailing wage laws, including the payment of prevailing wages, as applicable. In the event it is determined that the Consultant/Contractor is required to pay prevailing wages for the work performed under this Agreement, but failed to do so, the Consultant/Contractor shall pay all applicable penalties, costs, fees, wages, and wage differential. To the extent the project is subject to the requirement of payment of prevailing wages pursuant to California Labor Code sections 1720 et seq, then the project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Copies of the prevailing rate of per diem wages are on file at the City's offices, which shall be made available to any interested party on request. Consultant/Contractor shall cause a copy of the determination of the director of the prevailing rate of per diem wages to be posted at each job site, as well as all related notices required by applicable law and regulation.

9. WARRANTIES AND RESPONSIBILITIES - CONSULTANT/CONTRACTOR:

A. Consultant/Contractor agrees, represents and warrants to City that it has all licenses, permits, qualifications and approvals of whatever nature which are legally required for Consultant/Contractor to practice its profession and to properly provide the services set forth in **Exhibit A** in a manner which is consistent with the generally accepted standards of Consultant/Contractor's profession. Consultant/Contractor represents and warrants to City that Consultant/Contractor shall, at its sole cost and expense, keep in effect or obtain at all times during the term of this Contract any licenses, permits and approvals which are legally required for Consultant/Contractor to practice its profession at the time the services are performed.

B. Consultant/Contractor agrees and represents that the work performed under this Contract shall be in accordance with applicable federal, state and local law in accordance with Section 17.A hereof.

C. Consultant/Contractor shall designate a project manager who at all times shall represent the Consultant/Contractor before the City on all matters relating to this Contract. In the event that City, in its sole discretion, at any time during the term of this Contract, desires the removal of any person or persons assigned by Consultant/Contractor, including but not limited to the project manager, to perform services pursuant to this Contract, Consultant/Contractor shall remove any such person immediately upon receiving notice from City of the desire of City for the removal of such person or persons.



D. Except as set forth in **Exhibit D**, Consultant/Contractor shall, at its sole cost and expense, furnish all facilities, equipment, and other materials which may be required for furnishing services pursuant to this Agreement. City shall furnish to Consultant/Contractor only the facilities, equipment, and other materials listed in **Exhibit D** according to the terms and conditions set forth in **Exhibit D**.

E. Consultant/Contractor shall provide corrective services without charge to the City for services which fail to meet the above professional and legal standards and which are reported to Consultant/Contractor in writing within sixty (60) days of discovery. Should Consultant/Contractor fail or refuse to perform promptly its obligations, the City may render or undertake performance thereof and the Consultant/Contractor shall be liable for any expenses thereby incurred.

10. SUBCONTRACTING:

None of the services covered by this Contract shall be subcontracted without the prior written consent of the City, which will not be unreasonably withheld. Consultant/Contractor shall be as fully responsible to the City for the negligent acts and omissions of its contractors and subcontractors, and of persons either directly or indirectly employed by them, as it is for the negligent acts and omissions of persons directly employed by Consultant/Contractor.

11. ASSIGNABILITY:

Consultant/Contractor shall not assign or transfer any interest in this Contract whether by assignment or novation, without the prior written consent of the City which will not be unreasonably withheld. However, claims for money due or to become due to Consultant/Contractor from the City under this Contract may be assigned to a financial institution or to a trustee in bankruptcy, without such approval. Notice of any assignment or transfer whether voluntary or involuntary shall be furnished promptly to the City.

12. INTEREST IN CONTRACT:

Consultant/Contractor covenants that neither it, nor any of its employees, agents, contractors, subcontractors has any interest, nor shall they acquire any interest, direct or indirect, in the subject of the Contract, nor any other interest which would conflict in any manner or degree with the performance of its services hereunder. Consultant/Contractor shall make all disclosures required by the City's conflict of interest code in accordance with the category designated by the City, unless the City Manager determines in writing that Consultant/Contractor's duties are more limited in scope than is warranted by the category designated by the City code and that a narrower disclosure category should apply. Consultant/Contractor also agrees to make disclosure in compliance with the City conflict of interest code if, at any time after the execution of this Contract, City determines and notifies Consultant/Contractor in writing that Consultant/Contractor's duties under this Contract warrant greater disclosure by Consultant/Contractor than was originally contemplated. Consultant/Contractor shall make disclosures in the time, place and manner set forth in the conflict of interest code and as directed by the City.



13. MATERIALS CONFIDENTIAL:

All of the materials prepared or assembled by Consultant/Contractor pursuant to performance of this Contract are confidential and Consultant/Contractor agrees that they shall not be made available to any individual or organization without the prior written approval of the City, except by court order.

14. LIABILITY OF CONSULTANT/CONTRACTOR-NEGLIGENCE:

Consultant/Contractor shall be responsible for performing the work under this Contract in a manner which is consistent with the generally-accepted standards of the Consultant/Contractor's profession and shall be liable for its own negligence and the negligent acts of its employees, agents, contractors and subcontractors. The City shall have no right of control over the manner in which the work is to be done but only as to its outcome, and shall not be charged with the responsibility of preventing risk to Consultant/Contractor or its employees, agents, contractors or subcontractors.

15. INDEMNITY AND LITIGATION COSTS:

Consultant/Contractor shall indemnify, defend, and hold harmless the City, its officers, officials, agents, and employees and volunteers from and against any and all claims, damages, demands, liability, costs, losses and expenses, including without limitation court costs and reasonable attorneys' fees, arising in any manner by reason of negligent acts or negligent failure to act, recklessness, errors, omissions or willful misconduct incident to the performance of this Contract on the part of Consultant/Contractor except such loss or damage which was caused by the active negligence, sole negligence, or willful misconduct of the City. The provisions of this paragraph shall survive termination or suspension of this Contract.

16. CONSULTANT/CONTRACTOR TO PROVIDE INSURANCE:

A. Consultant/Contractor shall not commence any work before obtaining, and shall maintain in force at all times during the duration and performance of this Contract the policies of insurance specified in this Section. Such insurance must have the approval of the City as to limit, form, and amount, and shall be placed with insurers with a current A.M. Best's rating of no less than A:VII (or in the case of Worker's Compensation insurance, with the State Compensation Insurance Fund of California).

B. Prior to execution of this Contract and prior to commencement of any work, the Consultant/Contractor shall furnish the City with certificates of insurance and copies of original endorsements providing evidence of coverage for all policies required by the Contract. The endorsements shall be signed by a person authorized by the insurer to bind coverage on its behalf. The Consultant/Contractor agrees to furnish one copy of each required policy to the City, and additional copies as requested in writing, certified by an authorized representative of the insurer. The failure of Consultant/Contractor or of any of its contractors or subcontractors to maintain or renew coverage or to provide evidence of renewal may be treated by the City as a material breach of this Contract. Approval of the insurance by the City shall not relieve or decrease any liability of Consultant/Contractor.



C. In addition to any other remedy the City may have, if Consultant/Contractor fails to maintain the insurance coverage as required in this Section, the City may obtain such insurance coverage as is not being maintained, in form and amount substantially the same as is required herein, and the City may deduct the cost of such insurance from any amounts due or which may become due Consultant/Contractor under this Contract.

D. No policy required by this Contract shall be endorsed to suspended, voided, canceled, terminated by either party, or reduced in coverage or in limits unless the Consultant/Contractor has provided thirty (30) days' prior written notice by certified mail, return receipt requested, to the City.

E. Any deductibles, aggregate limits, pending claims or lawsuits which may diminish the aggregate limits, or self-insured retentions, must be declared to, and approved by, the City.

F. Aggregate Limits/Impairment.

If any of the insurance coverages required by this section contain annual aggregate limits, the Consultant/Contractor must give the City notice of any pending claim or lawsuit which may diminish the aggregate. The Consultant/Contractor must take steps to restore the impaired aggregates or provide replacement insurance protection. The City has the option to specify the minimum acceptable aggregate limit for each line of coverage required. No substantial reductions in scope of coverage which may affect City's protection are allowed without City's prior written consent.

G. The requirement as to types, limits, and the City's approval of insurance coverage to be maintained by Consultant/Contractor are not intended to, and shall not in any manner, limit or qualify the liabilities and obligations assumed by Consultant/Contractor under the Contract.

H. The Consultant/Contractor and its contractors and subcontractors shall, at their expense, maintain in effect at all times during the performance of work under the Contract not less than the following coverage and limits of insurance, which shall be maintained with insurers and under forms of policy satisfactory to the City. The maintenance by Consultant/Contractor and its contractors and subcontractors of the following coverage and limits of insurance is a material element of this Contract. The failure of Consultant/Contractor or of any of its contractors or subcontractors to maintain or renew coverage or to provide evidence of renewal may be treated by the City as a material breach of this Contract.

I. Worker's Compensation and Employer's Liability Insurance.

1. Worker's Compensation Insurance to protect the Consultant/Contractor, its contractors and subcontractors from all claims under Worker's Compensation and Employer's Liability Acts, including Longshoremen's and Harbor Worker's Act ("Acts"), if applicable. Such coverage shall be maintained, in type and amount, in strict compliance with all applicable state and federal statutes and regulations. The Consultant/Contractor shall execute a certificate of compliance with Labor Code Section 3700, on the form provided in the Contract Documents.



2. Consultant/Contractor shall provide a Waiver of Subrogation endorsement in favor of the City, its officers, officials, employees, agents and volunteers for losses arising from work performed by the Consultant/Contractor

J. Commercial General Liability Insurance

1. The insurance shall be provided on form CG0001, or its equivalent, and shall include coverage for claims for bodily injury or property damage arising out of premises/operations, products/completed operations, contractual liability, and subconsultant's work and personal and advertising injury resulting from actions, failures to act, or operations of the insured, or by its employees or agents, or by anyone directly or indirectly employed by the insured. The amount of insurance coverage shall not be less than \$1,000,000.00 per occurrence and \$2,000,000 general and products/completed operations aggregates.

2. The commercial general liability insurance shall also include the following:

a. Endorsement equivalent to CG 2010 1185 naming the City, its officers, officials, employees, agents, and volunteers as additional insureds. The endorsement shall contain no special limitations on the scope of protection afforded to the City, its officers, officials, employees or volunteers.

b. Endorsement stating insurance provided to the City shall be primary as respects the City, its officers, officials, employees and any insurance or self insurance maintained by the City, its officers, officials, employees or volunteers shall be in excess of the Consultant's insurance and shall not contribute with it, to the payment or satisfaction of any defense expenses, loss, or judgment.

c. Provision or endorsement stating that the Consultant's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

d. Provision or endorsement stating that any failure to comply with reporting or other provisions of the policies including breaches of representations shall not affect coverage provided to the City, its officers, officials, employees, or volunteers.

e. Provision or endorsement stating that such insurance, subject to all of its other terms and conditions, applies to the liability assumed by the Consultant/Contractor under the Contract, including, without limitation, set forth in Section 15, Indemnity and Litigation Costs.

K. Commercial Automobile Liability Insurance.

1. The commercial automobile liability insurance shall include, but shall not be limited to, protection against claims for death, bodily or personal injury, or property damage for owned, non-owned, and hired automobiles resulting from actions, failures to act, or operations of the insured, or by its employees or agents, or by anyone directly or indirectly



employed by the insured. The amount of insurance coverage shall not be less than \$1,000,000.00 per occurrence.

2. The commercial automobile liability insurance shall include the same endorsements as required for Commercial General Liability Insurance (16.J.2 above.)

L. Professional Liability.

The Consultant/Contractor and its contractors and subcontractors shall secure and maintain in full force, during the term of this Contract and for five years thereafter, professional liability insurance policies appropriate to the respective professions and the work to be performed as specified in this Contract. The limits of such professional liability insurance coverage shall not be less than \$1,000,000 per claim.

17. MISCELLANEOUS PROVISIONS:

A. Compliance With Laws. Consultant/Contractor shall keep itself fully informed of, shall observe and comply with, and shall cause any and all persons, firms or corporations employed by it or under its control to observe and comply with, applicable federal, state, county and municipal laws, ordinances, regulations, orders and decrees which in any manner affect those engaged or employed on the work described by this Contract or the materials used or which in any way affect the conduct of the work, including laws relating to prevailing wages pursuant to Labor Code section 1771 et seq.

B. Non-Discrimination. Consultant/Contractor shall not engage in unlawful employment discrimination. Such unlawful employment discrimination includes, but is not limited to, employment discrimination based upon a person's race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, gender, citizenship, or sexual orientation. Consultant/Contractor shall comply with Section 122(a) of the State and Local Fiscal Assistance Act of 1972.

C. Inspection of Records. Consultant/Contractor shall maintain and make available for inspection by the City and its auditors accurate records of all of its costs, disbursements and receipts with respect to any work under this Contract. Such inspections may be made during regular office hours at any time until six (6) months after the final payments under this Contract are made to the Consultant/Contractor.

D. Entirety of Agreement. This Contract constitutes the entire agreement between the parties relative to the services specified herein and no modification hereof shall be effective unless and until such modification is evidenced by a writing signed by both parties to this Contract. There are no understandings, agreements, conditions, representations, warranties or promises, with respect to this Contract, except those contained in or referred to in the writing.

E. Notices. All notices that are required to be given by one party to the other under this Contract shall be in writing and shall be deemed to have been given if delivered personally or enclosed in a properly addressed envelope and deposited in a United States Post Office for delivery by registered or certified mail addressed to the parties at the following addresses:



CITY:

Attn: City Manager
600 Sixth Street
Lincoln, CA 95648

CONSULTANT/CONTRACTOR: ATC GROUP SERVICES, LLC
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678

F. Governing Law. This Contract shall be interpreted and governed by the laws of the State of California.

G. Venue. Any action arising out of this Contract shall be brought in Placer County, California, regardless of where else venue may lie.

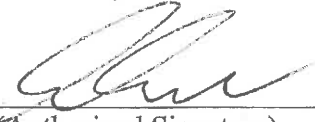
H. Attorneys' Fees. In any action brought by either party to enforce the terms of this Contract, each party shall be bear responsibility for its attorney's fees and all costs regardless of whether one party is determined to be the prevailing party.

I. Counterparts. The parties may execute this Contract in two or more counterparts, which shall, in the aggregate, be signed by all the parties, each counterpart shall be deemed an original instrument as against any party who has signed it.

J. Severability. If any term, provision, covenant, or condition of this Contract is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the Contract shall remain in full force and effect and shall in no way be affected, impaired, or invalidated.



ATC Group Services LLC
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678


(Authorized Signature)

Bryan Campbell, Branch Manager
Print Name

CITY OF LINCOLN,
a municipal corporation

Matthew Brower, City Manager

Dated

APPROVED AS TO FORM:

Leslie Walker, Interim City Attorney

Dated

ATTEST:

City Clerk

Dated

City Accountability:

Department responsible for contract:

Public Works Department

Staff responsible for contract:

Jennifer Hanson, Public Works Director



EXHIBIT A

SCOPE OF WORK

ATC Group Services LLC to provide consulting services for the Closed Lincoln Landfill Ongoing Monitoring and Maintenance Project for a three-year period, beginning FY 2016/2017 (September 13, 2016) and ending FY 2019/2020 (September 13, 2019), with the option to extend the contract for one additional three-year term.

(Please see attached proposal that includes the full list of services).



2. PROJECT UNDERSTANDING AND APPROACH

PROJECT UNDERSTANDING

ATC is pleased to provide the following cost estimate and scope of services for groundwater, surface water monitoring and reporting, site maintenance, and operation, maintenance and reporting for the dewatering system at the Closed Lincoln Landfill located in Placer County, California. Operation, maintenance and reporting for the dewatering system is a new addition to the previous contract scope. The scope of services is for a three-year period beginning the Second Half of 2016 through the First Half of 2019. The scope of work was developed in accordance with City of Lincoln's Request for Proposal dated April 29, 2016, the applicable Central Valley Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements (WDR), and Monitoring and Reporting Plan (MRP) No. R5-2003-0142.

MANAGEMENT PLAN

- > ATC will perform the tasks defined within the above-referenced RFP, Addenda, WDRs, GMPs, and WQO consistent with State of California Code of Regulations Title 27;
- > The ATC project manager will perform staff scheduling and coordination, and provide general project oversight (including budgeting, billing, and client interaction). The project manager will also monitor program compliance and act as the primary regulatory agency contact;
- > The ATC project scientist will prepare the monitoring reports under the supervision of a State of California Registered Professional Geologist (PG) or Professional Engineer (PE);
- > ATC project geologists, scientists and technicians will report directly to the ATC project manager and will perform field work under the direction of the project manager and/or principal engineer. ATC personnel resumes are included as Appendix A.

SCOPE OF WORK

As presented in the RFP and MRP R5-2003-0142 for the site, the tasks and their frequency are provided in the table below. (Note: Tasks anticipated to be completed concurrently when possible.)

	Task	Estimated Duration	Monitoring Frequency	Report Due
Groundwater	Elevation and Gradient Monitoring	1 day ¹	Quarterly	January 31 and July 31
	Background and Corrective Action Monitoring	2 days	Semiannually	January 31 and July 31
	Constituents of Concern	2 days ¹	Once every five years (first half 2019)	July 31, 2019
Surface Water	Corrective Action Monitoring	1 day ¹	Semiannually	January 31 and July 31
Facility	Standard Observations	1 day ¹	Quarterly	
	Maintenance Inspections	1 day ¹	Quarterly	January 31 and July 31
	Mowing and Fire Break Maintenance	1 day ¹	5 events annually	NA
	Site Repairs	TBD	Annually (as required by RWQCB or County)	NA
	Storm Water Control Inspections	1 day ²	Monthly and within 7 days after storm events	NA



	Task	Estimated Duration	Monitoring Frequency	Report Due
	Site Winterization	1 day	Annually – Prior to September 30	NA
Dewatering System	Measure Water Levels in Wells, Piezometers, and Sumps Monitor and Sample Sumps	1 day ¹	Quarterly	January 31, April 30, July 31, October 31
	Collect Samples from 4 Sumps	1 day ¹	Quarterly	January 31, April 30, July 31, October 31
	Remote Telemetry Monitoring	1 hour	Weekly	January 31, April 30, July 31, October 31

Notes:

¹ Task anticipated to be completed concurrently with groundwater monitoring when possible.

² Storm water control inspections to be performed at Closed Lincoln Landfill on a monthly basis during the rainy season and following significant storm events.

Groundwater and Surface Water Gauging, Sampling, and Reporting

Gauging and Sampling - Groundwater gauging will be conducted by ATC quarterly at the Closed Lincoln Landfill per the MRP for the site; groundwater gauging will be performed concurrently with the semiannual groundwater sampling events at the site and performed to comply with the Sampling and Analysis Plan (SAP) prepared by AEG, November 2003. Groundwater levels will be measured in all 17 monitoring wells using an electronic groundwater level indicator. The measuring equipment will be decontaminated prior to and following each measurement using a solution of phosphate-free detergent and water followed by a tap water rinse and a final deionized or distilled water rinse.

Groundwater and surface water sampling will be conducted by ATC semi-annually using dedicated or portable submersible pumps, as needed. Each monitoring well will be purged consistent with recent purging methodologies by removing three casing volumes or until the well goes dry. Samples will be collected from all 17 wells and the two surface sampling points located on Auburn Ravine for the constituents of concern (COCs) as identified in the MRP for the site and collected in appropriate bottleware provided by the laboratory. Duplicate samples will be collected at a frequency of ten percent per the SAP. All purge water collected will be disposed into the City of Lincoln's sanitary sewer system. During all monitoring events, the following will be collected:

Field Parameters collected during purging:

1. Temperature
2. pH
3. Conductivity
4. Oxidation-reduction potential (ORP)
5. Turbidity
6. Dissolved oxygen (DO), prior to purge and following sample collection

Samples collected will be analyzed by a California state certified laboratory for:

1. Total Suspended Solids by SM 2540C
2. Total Dissolved Solids by EPA Method 160.1
3. Alkalinity by SM 2320B
4. Bicarbonate by SM 2310B
5. Chloride by EPA Method 300.0
6. Nitrate as Nitrogen by EPA Method 300.0
7. Sulfates by EPA Method 300.0
8. Calcium by EPA Method 200.7
9. Magnesium by EPA Method 200.7
10. Potassium by EPA Method 200.7
11. Sodium by EPA Method 200.7
12. VOCs by EPA Method 8260B
13. Field Blank and trip blank by EPA Method 8260B



Reporting - Semi-annual monitoring reports will be prepared by ATC for the Closed Lincoln Landfill consistent with the MRP for the site. Each report will include the results of groundwater, surface water, and site monitoring and sampling. The reports will summarize all activities occurring during the monitoring period (six month periods from January 1 to June 30 [first semi-annual] and July 1 to December 31 [second semi-annual]). Consistent with the MRP, the due dates for the first semi-annual monitoring report will be July 31 of each year, and the due date for the second semi-annual monitoring report will be January 31 of each year. The semi-annual reports will contain, at a minimum:

1. A report describing the activities conducted;
2. A compliance evaluation summary;
3. Tabulated well construction data;
4. Tabulated groundwater elevation monitoring results;
5. Tabulated summary of corrective action monitoring data including current and historical analytical results;
6. Groundwater elevation contour maps for each quarter;
7. Contaminant contour maps for the sampling period;
8. Plots and/or graphs and narratives of analytical and corrective action results;
9. Field logs and sampling records;
10. Certified laboratory analytical results showing MDLs and PQLs;
11. Statistical analysis printouts and summary discussion;
12. Discussion of results; and
13. A compliance evaluation summary.
14. The annual reports (the second semi-annual report) will additionally contain:
15. Trend analysis and summary of water quality data during the prior year; and
16. Contaminant contour maps with a discussion of plume changes during the prior year.
17. A five-year review will be included in the semi-annual report for the first half of 2019 and will contain:
18. Results and discussion of constituents of concern for the year;
19. Corrective action monitoring tabular summary; and
20. Contaminant contour maps with a discussion of plume changes during the prior year.

Stormwater Monitoring – Though not specified in the RFP, ATC's understanding is that the site no longer requires the previously required stormwater monitoring and sampling. The site was formerly covered under the RWQCB General Industrial Stormwater Permit, but a Notice of Termination of coverage under the permit was approved by the RWQCB in a letter dated June 16, 2015. However, ATC has included contingent pricing to perform this monitoring should circumstances change.

ATC also understands that stormwater monitoring and sampling was required for construction of the new dewatering system at the site under the site specific SWPPP. Since construction of the system is complete, SWPPP monitoring and sampling will no longer be required.

Our understanding is that the only stormwater related task consists of inspecting stormwater control features. Our proposal includes these includes performance of these inspections monthly, and within 7 days of a major storm event, as described in section G-2 of the MRP (R5-2003-0142). To increase efficiency, these inspections will be performed concurrently with other site activities when possible.



Facility Maintenance

Facility Inspections - ATC will conduct quarterly standard site inspections concurrently with the quarterly groundwater gauging events. Additionally, one winterization inspection will be conducted, prior to September 30. Inspections will identify any damage to:

1. Landfill cover;
2. Grade;
3. Precipitation and drainage controls;
4. Access roads; and
5. Other site facilities.

If and when any repairs are needed, ATC will coordinate with the City for repairs.

Fire Break and Mowing - ATC will conduct a maximum of five fire break mowing events as needed.

Monitoring, Sampling, Operation, Maintenance, and Reporting for the Dewatering System

Groundwater Level Measurements - ATC will perform quarterly groundwater gauging of 17 monitoring wells, two dual-nested piezometers, and four sumps at the site. This activity will be performed concurrently with quarterly groundwater gauging required under the MRP and no additional costs will be associated with this portion of the scope.

Sump Sampling - ATC will perform quarterly sampling of any sumps that have discharged water to the sanitary sewer during the quarter. This task will be performed concurrently with the quarterly groundwater gauging events. ATC will not accumulate any additional labor costs for this task.

Weekly Telemetry Monitoring - ATC will perform weekly remote monitoring of the dewatering system through Instrumentation Northwest's online database to assure that the pumps are operating within their design specifications.

3. QUALITY ASSURANCE / QUALITY CONTROL

ATC will continue to implement our established QA/QC program for groundwater sampling at the site, which includes but is not limited to the following:

- Collection and analysis of field blanks, trip blanks, equipment blanks, and duplicates
- Documented calibration of field instrumentation
- Use of dedicated tubing and pumps
- Decontamination of water level meter between wells
- Data validation of laboratory results
- Chain of Custody protocol
- Senior review of all reports

Quality Assurance and Quality Control (QA/QC), will be overseen by an experienced California-registered Geologist and/or a Professional Engineer. For this project, all activities, data, and reporting will be reviewed by Mr. Gabe Stivala, P.G. and Ms. Jeanne Homsey, P.E. Mr. Stivala's and Ms. Homsey's experience is summarized in their respective resumes included in **Appendix A**.



EXHIBIT B

SCHEDULE OF PERFORMANCE

ATC to provide consulting services for the Closed Lincoln Landfill Ongoing Monitoring and Maintenance Project for a three-year period, beginning FY 2016/2017 (September 13, 2016) and ending FY 2019/2020 (September 13, 2019), with the option to extend the contract for one additional three-year term, for a total contract amount not to exceed \$135,852 (10% contingency included).



EXHIBIT C

CERTIFICATE OF COMPLIANCE WITH LABOR CODE § 3700 Labor Code § 1861

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

ATC Group Services LLC

By: 

Title

Bryan Campbell, Branch Manager

Print Name

September 1, 2016

Date



EXHIBIT D

FACILITIES, EQUIPMENT, OTHER MATERIALS

Consultant/Contractor shall be responsible for providing all necessary facilities, equipment and personnel to undertake the necessary task(s) outlined in **Exhibit A**.



CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY)
09/01/2016

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Aon Risk Services Southwest, Inc. Houston TX Office 5555 San Felipe Suite 1500 Houston TX 77056 USA		CONTACT NAME: PHONE (A/C. No. Ext): (866) 283-7122 FAX (A/C. No.): (800) 363-0105 E-MAIL ADDRESS:	
INSURED ATC Group Services LLC 221 Rue De Jean Suite 200 Lafayette LA 70508-3283 USA		INSURER(S) AFFORDING COVERAGE INSURER A: Steadfast Insurance Company INSURER B: Zurich American Ins Co INSURER C: INSURER D: INSURER E: INSURER F:	
		NAIC # 26387 16535	

Holder Identifier :

COVERAGES

CERTIFICATE NUMBER: 570063510840

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:			GPL021708500	11/13/2015	11/13/2016	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$100,000 MED EXP (Any one person) \$5,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$1,000,000 PRODUCTS - COMP/OP AGG \$1,000,000
B	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY			BAP 0217109-00	11/13/2015	11/13/2016	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)
A	<input type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED RETENTION			SXS021707700	11/13/2015	11/13/2016	EACH OCCURRENCE \$1,000,000 AGGREGATE \$1,000,000
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below Y/N N N/A			WC021711100	11/13/2015	11/13/2016	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$1,000,000 E.L. DISEASE-EA EMPLOYEE \$1,000,000 E.L. DISEASE-POLICY LIMIT \$1,000,000
A	Env Contr Pol			GPL021708500	11/13/2015	11/13/2016	Policy Aggregate \$1,000,000 Each Incident \$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

The City of Lincoln, its officers, officials, employees, agents and volunteers are included as Additional Insured in accordance with the policy provisions of the General Liability and Automobile Liability policies. A waiver of Subrogation is granted in favor of The City of Lincoln, its officers, officials, employees, agents and volunteers in accordance with the policy provisions of the workers' Compensation policies.

CERTIFICATE HOLDER**CANCELLATION**

City of Lincoln Attn: City Manager 600 Sixth Street Lincoln CA 95648 USA	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE <i>Aon Risk Services Southwest, Inc.</i>

Certificate No : 570063510840



ADDITIONAL REMARKS SCHEDULE

Page _ of _

AGENCY Aon Risk Services Southwest, Inc.		NAMED INSURED ATC Group Services LLC	
POLICY NUMBER See Certificate Number: 570063510840		EFFECTIVE DATE:	
CARRIER See Certificate Number: 570063510840	NAIC CODE		

ADDITIONAL REMARKS

**THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,
FORM NUMBER: ACORD 25 FORM TITLE: Certificate of Liability Insurance**

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER	
INSURER	
INSURER	
INSURER	

ADDITIONAL POLICIES

If a policy below does not include limit information, refer to the corresponding policy on the ACORD certificate form for policy limits.

[illegible]

Additional Insured-Automatic-Owners, Lessees Or Contractors



Coverage Part One-Commercial General Liability
Coverage Part Two-Contractor's Pollution Liability

Policy No.	Eff. Date of Pol.	Exp. Date of Pol.	Eff. Date of End.	Producer	Add'l Prem.	Return Prem.
GPL 0217085-00	11/13/2015	11/13/2016	11/13/2015	14340000	-----	-----

Named Insured and Mailing Address:

ATC GROUP PARTNERS, LLC
221 RUE DE JEAN
LAFAYETTE, LA 70508-8501

Producer:

AON RISK SERVICES SOUTHWEST, INC.
5555 SAN FELIPE ST STE 1500
HOUSTON, TX 77056-2739

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

This endorsement modifies insurance provided under the following:

Environmental Services Package Policy

- ☒ COVERAGE PART ONE-COMMERCIAL GENERAL LIABILITY
☒ COVERAGE PART TWO-CONTRACTOR'S POLLUTION LIABILITY

1. Who is an Insured (Section I.) in the COMMON COVERAGE PROVISIONS is amended to include as an insured any person or organization whom you are required to add as an additional insured on this policy under a written contract or written agreement.
2. The insurance provided to the additional insured person or organization applies only to:
 - a. "Bodily injury", "property damage" or "personal and advertising injury" under COVERAGE PART ONE-COMMERCIAL GENERAL LIABILITY, COVERAGE A - BODILY INJURY AND PROPERTY DAMAGE LIABILITY and COVERAGE B - PERSONAL AND ADVERTISING INJURY LIABILITY caused, in whole or in part, by:
 - (1) Your acts or omissions; or
 - (2) The acts or omissions of those acting on your behalf;and resulting directly from:
 - (a) Your ongoing operations performed for the additional insured, which is the subject of the written contract or written agreement; or
 - (b) "Your work" completed as included in the "products-completed operations hazard", performed for the additional insured, which is the subject of the written contract or written agreement; and/or
 - b. "Claims" arising out of a "pollution event" under COVERAGE PART TWO - CONTRACTOR'S POLLUTION LIABILITY, caused, in whole or in part, by:
 - (1) Your acts or omissions; or

(2) The acts or omissions of those acting on your behalf,

and resulting directly from:

(a) "Covered operations" performed for the additional insured, which is the subject of the written contract or written agreement; or

(b) "Completed operations" of the "covered operations" performed for the additional insured, which is the subject of the written contract or written agreement.

3. However, regardless of the provisions of paragraphs 1. and 2. above:

a. We will not extend any insurance coverage to any additional insured person or organization:

(1) That is not provided to you in this policy; or

(2) That is broader coverage than you are required to provide to the additional insured person or organization in the written contract or written agreement; and

b. We will not provide Limits of Insurance to any additional insured person or organization that exceed the lower of:

(1) The Limits of Insurance provided to you in this policy; or

(2) The Limits of Insurance you are required to provide in the written contract or written agreement.

4. The insurance provided to the additional insured person or organization does not apply to:

"Bodily injury", "property damage" or "personal and advertising injury" arising out of the rendering or failure to render any professional architectural, engineering or surveying services including:

a. The preparing, approving or failing to prepare or approve maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; and

b. Supervisory, inspection, architectural or engineering activities.

5. The additional insured must see to it that:

a. We are notified as soon as practicable of an "occurrence", offense or "pollution event", as applicable, that may result in a claim;

b. We receive written notice of a claim or "suit" as soon as practicable; and

c. A request for defense and indemnity of the claim or "suit" will promptly be brought against any policy issued by another insurer under which the additional insured may be an insured in any capacity. This provision does not apply to insurance on which the additional insured is a Named Insured, if the written contract or written agreement requires that this coverage be primary and non-contributory.

6. For the coverage provided by this endorsement:

a. The following paragraph is added to Paragraph 8.a. Other Insurance, Conditions (Section V.) in the COMMON COVERAGE PROVISIONS:

This insurance is primary insurance as respects our coverage to the additional insured person or organization, where the written contract or written agreement requires that this insurance be primary and non-contributory with respect to any other policy upon which the additional insured is a Named Insured. In that event, we will not seek contribution from any other such insurance policy available to the additional insured on which the additional insured person or organization is a Named Insured.

b. The following paragraph is added to Paragraph 8.b. Other Insurance, Conditions (Section V.) in the COMMON COVERAGE PROVISIONS:

This insurance is excess over:

Any of the other insurance, whether primary, excess, contingent or on any other basis, available to an additional insured, in which the additional insured on our policy is also covered as an additional insured on another policy providing coverage for the same "occurrence", offense, claim or "suit". This provision does not apply to any

policy in which the additional insured is a Named Insured on such other policy and where our policy is required by written contract or written agreement to provide coverage to the additional insured on a primary and non-contributory basis.

7. This endorsement does not apply to an additional insured which has been added to this policy by an endorsement showing the additional insured in a Schedule of additional insureds, and which endorsement applies specifically to that identified additional insured.

ALL OTHER TERMS AND CONDITIONS OF THE POLICY SHALL APPLY AND REMAIN UNCHANGED.

POLICY NUMBER: BAP 0217109-00

COMMERCIAL AUTO
CA 20 01 10 13

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

LESSOR – ADDITIONAL INSURED AND LOSS PAYEE

This endorsement modifies insurance provided under the following:

AUTO DEALERS COVERAGE FORM
BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement.

This endorsement changes the policy effective on the inception date of the policy unless another date is indicated below.

Named Insured:

Endorsement Effective Date:

SCHEDULE

Insurance Company: ZURICH AMERICAN INSURANCE COMPANY	
Policy Number: BAP 0217109-00	Effective Date: 11-13-2015
Expiration Date: 11-13-2016	
Named Insured: ATC GROUP PARTNERS, LLC	
Address: 221 RUE DE JEAN LAFAYETTE LA 70508-8501	
Additional Insured (Lessor): ALL LESSORS Address: - LAFAYETTE, LA USA 70508	
Designation Or Description Of "Leased Autos": BLANKET ANY LEASED VEHICLE	

Coverages	Limit Of Insurance
Covered Autos Liability	Each "Accident"
Comprehensive	Actual Cash Value Or Cost Of Repair Whichever Is Less, Minus Deductible For Each Covered "Leased Auto"
Collision	Actual Cash Value Or Cost Of Repair Whichever Is Less, Minus Deductible For Each Covered "Leased Auto"
Specified Causes Of Loss	Actual Cash Value Or Cost Of Repair Whichever Is Less, Minus Deductible For Each Covered "Leased Auto"
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. Coverage

- Any "leased auto" designated or described in the Schedule will be considered a covered "auto" you own and not a covered "auto" you hire or borrow.
- For a "leased auto" designated or described in the Schedule, the **Who Is An Insured** provision under **Covered Autos Liability Coverage** is changed to include as an "insured" the lessor named in the Schedule. However, the lessor is an "insured" only for "bodily injury" or "property damage" resulting from the acts or omissions by:
 - You;
 - Any of your "employees" or agents; or
 - Any person, except the lessor or any "employee" or agent of the lessor, operating a "leased auto" with the permission of any of the above.
- The coverages provided under this endorsement apply to any "leased auto" described in the Schedule until the expiration date shown in the Schedule, or when the lessor or his or her agent takes possession of the "leased auto", whichever occurs first.

B. Loss Payable Clause

- We will pay, as interest may appear, you and the lessor named in this endorsement for "loss" to a "leased auto".

- The insurance covers the interest of the lessor unless the "loss" results from fraudulent acts or omissions on your part.
- If we make any payment to the lessor, we will obtain his or her rights against any other party.

C. Cancellation

- If we cancel the policy, we will mail notice to the lessor in accordance with the Cancellation Common Policy Condition.
- If you cancel the policy, we will mail notice to the lessor.
- Cancellation ends this agreement.

- The lessor is not liable for payment of your premiums.

E. Additional Definition

As used in this endorsement:

"Leased auto" means an "auto" leased or rented to you, including any substitute, replacement or extra "auto" needed to meet seasonal or other needs, under a leasing or rental agreement that requires you to provide direct primary insurance for the lessor.

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

This agreement shall not operate directly or indirectly to benefit anyone not named in the Schedule.

Schedule

ALL PERSONS AND/OR ORGANIZATIONS THAT ARE REQUIRED BY WRITTEN CONTRACT OR AGREEMENT WITH THE INSURED, EXECUTED PRIOR TO THE ACCIDENT OR LOSS, THAT WAIVER OF SUBROGATION BE PROVIDED UNDER THIS POLICY FOR WORK PERFORMED BY YOU FOR THAT PERSON AND/OR ORGANIZATION

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated.

(The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

Endorsement Effective

Policy No.

Endorsement No.

Insured

Premium \$

Insurance Company

Countersigned By _____



CERTIFICATE OF PROPERTY INSURANCE

DATE (MM/DD/YYYY)
09/01/2016

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

PRODUCER
Aon Risk Services Southwest, Inc.
Houston TX Office
5555 San Felipe
Suite 1500
Houston TX 77056 USA

CONTACT NAME:
PHONE
(A/C. No. Ext): (866) 283-7122 **FAX**
(A/C. No.): (800) 363-0105
E-MAIL ADDRESS:
PRODUCER
CUSTOMER ID #: 570000067092

INSURED
ATC Group Services LLC
221 Rue De Jean
Suite 200
Lafayette LA 70508-3283 USA

INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A:	Zurich American Ins Co	16535
INSURER B:		
INSURER C:		
INSURER D:		
INSURER E:		
INSURER F:		

COVERAGES**CERTIFICATE NUMBER:** 570063510841**REVISION NUMBER:**

LOCATION OF PREMISES / DESCRIPTION OF PROPERTY (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE		POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	COVERED PROPERTY	LIMITS
A	<input checked="" type="checkbox"/>	PROPERTY	MLP021707500	11/13/2015	11/13/2016	BUILDING	
		CAUSES OF LOSS				PERSONAL PROPERTY	
		BASIC				BUSINESS INCOME	
		BROAD				EXTRA EXPENSE	
		SPECIAL				RENTAL VALUE	
		EARTHQUAKE				BLANKET BUILDING	
		WIND				BLANKET PERS PROP	
		FLOOD				BLANKET BLDG & PP	
	<input checked="" type="checkbox"/>	ALL RISK-Subject to Exclusions				<input checked="" type="checkbox"/> Loss Limit	\$15,000,000
	<input type="checkbox"/>	INLAND MARINE	TYPE OF POLICY				
		CAUSES OF LOSS	POLICY NUMBER				
		NAMED PERILS					
	<input type="checkbox"/>	CRIME					
		TYPE OF POLICY					
	<input type="checkbox"/>	BOILER & MACHINERY / EQUIPMENT BREAKDOWN					

SPECIAL CONDITIONS / OTHER COVERAGES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

CERTIFICATE HOLDER

City of Lincoln
Attn: City Manager
600 Sixth Street
Lincoln CA 95648 USA

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Aon Risk Services Southwest, Inc.

Holder Identifier :

CERTIFICATE NUMBER: 570063510841





May 20, 2016

Reference No. 11119086

Mr. Ray Leftwich, P.E.
City of Lincoln Engineering Department
600 Sixth Street
Lincoln, California 95648

Re: **Proposal for Engineering Services
 Closed Lincoln Landfill Monitoring Project**

Dear Mr. Leftwich:

GHD Services Inc. (GHD) is pleased to submit this proposal to provide Engineering Services at the Closed Lincoln Landfill for the City of Lincoln City Engineer Department (City), in Lincoln, California. We have reviewed the City's *Request for Proposals (RFP)*, dated April 29, 2016 and have prepared this proposal in response to the RFP.

Based on our review of the RFP, the scope of work is associated with work necessary to comply with Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements (WDRs) Order No. R5-2003-0142 and RWQCB Cleanup and Abatement order (CAO) No. R5-2014-0703, as well as the Site's Corrective Action Work Plan. This includes:

- 1) Groundwater monitoring and sampling of existing monitoring wells
- 2) Monitoring of the dewatering system
- 3) Maintenance of surface cap
- 4) Storm water monitoring
- 5) Compliance reporting

Our local team of hydrogeologists, engineers and environmental scientists has significant experience associated with the tasks above and are excited to showcase our qualifications and capabilities.

Thank you very much for considering GHD's qualifications. Should you have any questions on the proposal, please do not hesitate to contact Morgan Hargrave at (916) 889 8930 or email at morgan.hargrave@ghd.com.

Sincerely,
GHD

A handwritten signature in black ink, appearing to read "M. Hargrave", is written over a light blue horizontal line.

Morgan Hargrave
Project Manager

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1. GHD Information and Qualifications

GHD is one of the world's leading engineering and environmental consulting companies. Established in 1928, GHD employs more than 8,000 people across five continents and serves clients in the global markets of water, energy and resources, environment, property and buildings and transportation.

As a privately held company wholly-owned by its people, GHD is focused on client success. Our global network of engineers, scientists, planners, project managers and economists collaborate to deliver sustainable outcomes for our clients and communities. We care for the wellbeing of our people, communities and the environments in which we live and work.

GHD's West Operating Center maintains fifteen offices in the State of California alone, including Sacramento and Rancho Cordova; these multiple locations allow us to respond quickly to local client requests. Clients benefit from our 60+ years of local knowledge and experience. Additionally, GHD operates under a "One GHD" approach, which enables us to pull resources from anywhere in the world to bolster project teams for the benefit of our municipal clients.

1.1 Company Information

Consultant Legal Name | GHD Services, Inc.

Consultant Mailing Address | 10969 Trade Center Drive, Suite 107, Rancho Cordova CA 95670

Contact Information | Mr. Matt Weber, PE will be the legally responsible principal at the firm for this project. Mr. Weber works out of our Sacramento, California office and his contact details are as follows:

Mr. Matt Weber T: 1 916 372 6606

3831 North Freeway Blvd. Sacramento, CA 95834-1933

Mr. Morgan Hargrave will be the point of contact for the project. Mr. Hargrave is a project manager with experience specific to the primary tasks of the RFP. He works out of our Rancho Cordova, California office and his contact details are as follows:

Mr. Morgan Hargrave T: 1 916 889 8930

10969 Trade Center Drive, Suite 107 Rancho Cordova CA 95670

1.2 GHD Qualifications

GHD professionals have been actively involved in solid waste management projects in North America for decades. We have worked on hundreds of different public and private sector landfills, and in so doing, have considerable first-hand expertise in all aspects of landfill design, construction, operation, maintenance, monitoring, closure, and post-closure monitoring and maintenance. Locally, the GHD project team located in Sacramento and Rancho Cordova regularly works on dozens of environmental monitoring and assessment sites under oversight by the Central Valley Regional Water Quality Control Board, many involving Clean and Abatement Orders and associated Monitoring and Reporting Requirements (MRP). Our Project Manager's specific experience with groundwater monitoring and sampling, reporting and compliance fits the City

In addition, our experience includes hydrogeological studies, geotechnical studies, environmental assessments, contaminant assessments, remedial design, and implementation/construction of remedial strategies. We have performed solid waste design and construction projects throughout North America with various clients and regulatory agencies. Our success has been through a combination of open discussion with the client and regulatory officials to determine the appropriate course of action. We have also been very successful in negotiating with regulatory agencies to obtain approval for permitting modifications to improve operating efficiencies and reduce operational costs. These successes are a direct result of having the technical expertise and depth of personnel to provide engineering services, as well as the knowledge of regulations and the appropriate approval processes to achieve success for our clients and the industry.

Our diverse range of project experience and technical expertise allows us to provide effective solutions to virtually any solid waste management project challenges.

2. Project Understanding and Approach

The City of Lincoln City Engineer Department (City) is seeking assistance with ongoing monitoring of the Closed Lincoln Landfill as subjected by requirements put forth by the California Regional Water Quality Control Board (RWQCB) in Waste Discharge Requirements (WDR) Order No. R5-2003-0142 and Cleanup and Abatement Order (CAO) No. R5-2014-0703. As requested, the Scope of Work is provided below, and is based on the requirements of the current WDRs and CAO for the landfill.

2.1 Overall Approach and Methodologies

GHD's approach to ongoing monitoring of the Closed Lincoln Landfill includes the following:

- Utilizing the experience and knowledge of the local project team in managing environmental sites under similar WDR and CAO orders put forth by the RWQCB.
- Applying years of experience with management of sites with ongoing groundwater and surface water monitoring and sampling.
- Employing industry leading quality assurance (QA)/quality control (QC) techniques to deliver the consistent high quality service expected by our clients.
- Exploiting innovative solutions to common problems as identified, such as an electronic data access tool (eDAT) program which manages monitoring data using GIS software, allowing the City to access monitoring data electronically to be manipulated as required; and/or collecting and issuing monitoring data electronically and remotely in real time using tablet computers to enter field measurements and parameter data in the field, resulting in data that is immediately uploaded and accessible by management and clients as it happens, while reducing translation errors.

2.2 Scope of Work

The Scope of Work for implementing the PCMMP for the Closed Lincoln Landfill is based on the requirements of the following documents:

- Waste Discharge Requirements for City of Lincoln, Lincoln Landfill, Class III Landfill, Post-Closure Maintenance and Corrective Action, Placer County, Order No. R5-2013-0142, California Regional Water Quality Control Board, Central Valley Region, September 5, 2003

- Cleanup and Abatement Order R5-2014-0703 for City of Lincoln, Lincoln Landfill, Placer County, California Regional Water Quality Control Board, Central Valley Region, May 27, 2014
- Corrective Action Work Plan, Closed Lincoln Landfill, Virginiatown Road, Lincoln, Placer County, California, prepared by Holdrege & Kull, September 2013

GHD also reviewed the following reports and correspondence in developing the Scope of Work:

- Quarterly Progress Report, First Quarter 2016, prepared by Holdrege & Kull, March 2016
- System Startup and Fourth Quarter 2015 Operation and Maintenance Report, prepared by Holdrege & Kull, January 2016
- Annual Monitoring Report – 2015, prepared by ATC Group Services LLC, January 2016
- Report of Sump Repair, Holdrege & Kull, December, 2015
- Quarterly Progress Report, Third Quarter 2015, prepared by Holdrege & Kull, September 2015
- Semi-Annual Monitoring Report – First Half 2015, prepared by Cardno ATC Group Services LLC, July 2015
- Review of Corrective Action Work Plan, Closed Lincoln Landfill, Placer County, Central Valley Regional Water Quality Control Board, October 2014

The Scope of Work for the Closed Lincoln Landfill is detailed below and is summarized under the Tasks identified in the Request for Proposal (RFP). Many of the monitoring events required under the WDR and CAO overlap and shall be performed during the same site visit.

2.2.1 Compliance Monitoring as required by WDR R5-2003-0142

2.2.1.1 Winterization Inspection and Report

Site Inspection

An annual site inspection shall be performed prior to the rainy season but no later than September 30, for the purpose of winterizing the Site. This event will be conducted along with the second semi-annual monitoring and sampling event. The inspection shall identify any damage to the landfill cover, grade, precipitation and drainage controls, access roads, and other Site facilities. GHD will coordinate with the City any needed repairs, which shall be completed by October 31 as described in the WDR.

Reporting

By November 15 of each year, GHD shall submit a report describing the results of the winterization inspection and any repair measures implemented, including photographs of identified problems and the repairs. The annual winterization report will be combined with the required annual monitoring and sampling report.

2.2.1.2 Semi-Annual Monitoring and Reporting, Second Half 2016 through Second Half 2018

As required by the WDR, perform Semi-Annual Monitoring at the Closed Lincoln Landfill beginning with the Second Half of 2016 and continuing through the Second Half of 2018.

Quarterly Groundwater Levels

Travel to the site on a quarterly basis and collect depth to groundwater data. This data will be used to calculate groundwater gradient and direction of flow.

Semi-Annual Groundwater Sampling

During the quarterly groundwater level gauging events in March and September, collect groundwater samples from all seventeen groundwater monitoring wells and two surface water sampling points along Auburn Ravine. Wells shall be purged of a minimum of three well volumes (or until dry) while collecting temperature, pH, conductivity and turbidity readings of the purge water. The purge water will be disposed of into the City of Lincoln's sanitary sewer system at a point to be determined by the City. Samples will be analyzed as per the Monitoring and Reporting Program (MRP) of the WDR.

Semi-Annual Groundwater Monitoring Reporting

Upon receipt of the analytical data, a semi-annual report will be prepared including the following information:

1. The cumulative results of quarterly groundwater elevation monitoring;
2. Tabular summaries of corrective action monitoring data showing sampling dates, well constituents, concentrations, concentration limit, and units. The data shall be presented so as to clearly show historical concentrations at each well. The table shall also clearly show whether new monitoring data exceedances occurred during the monitoring period;
3. Contaminant contour maps of representative corrective action monitoring data, showing the estimated extent of the contaminant plume;
4. Plots, graphical summaries and narrative discussion of the results of corrective action monitoring;
5. A compliance evaluation summary for the monitoring period;
6. Field and laboratory tests sheets; and,
7. An electronic copy of the data in PDF format.

Also included in this task are the costs necessary to comply with Assembly Bill 2886 (Uploading data into the GeoTracker data base).

Annual Monitoring Summary Reporting

Each second half semi-annual monitoring report will also include an Annual Monitoring Summary Report. The Annual Monitoring Summary Report will include a summary of the detection and corrective action monitoring results for the prior year and include a discussion of compliance with the WDRs. The report will include both tabular and graphical summaries of the prior year's monitoring data, including time series plots of historical monitoring data for each monitoring parameter/COC. For corrective action monitoring data, the report shall also include the following:

1. A tabular summary of well information from the installation logs, including well name, top of casing elevation, total depth, depths/elevations of screened interval, and the soil type(s) over the screened interval;
2. A summary of the results of trend analysis performed on each constituent of the release during the prior year;

3. A summary of the results of water chemistry analysis of water quality data collected during the prior year, including illustrative graphs and plots (i.e. Stiff diagrams, Trilinear plots; etc.); and,
4. Contaminant contour maps for representative constituents (i.e. TDS and chlorides) constructed as part of semi-annual reporting during the prior year and a discussion as to whether the size of the plume has increased, decreased, or remained the same since the previous monitoring year.

Also included in this task are the costs necessary to comply with Assembly Bill 2886 (Uploading data into the GeoTracker database).

2.2.1.3 Semi-Annual Monitoring with the Constituents of Concern Five Year Report, First Half 2019

As required by the WDR, perform Semi-Annual Monitoring and Reporting for the Second Half of 2019 with the Constituents of Concern Five Year Report for all wells. Groundwater samples will be analyzed as outlined in Attachments C and of the MRP of the WDR. Additional reporting requirements will be added to that year's Annual Monitoring Summary Report.

2.2.1.4 Annual Maintenance

As required by the Placer County Division of Environmental Health (County), the surface of the landfill is to be mowed on an as needed basis to minimize cover for rodents and reduce fire danger. The County is concerned that burrow holes created by the rodents could damage the integrity of the clay cap to the landfill, allowing leachate to migrate to groundwater. A majority of the landfill can be mowed using a commercial mower. However, the perimeter, berms and areas covered with cobbles have to be trimmed by hand. For the purposes of this proposal, it is assume the surface of the landfill will need to be mowed five times during each spring/summer season.

2.2.1.5 Site Repairs

Placer County performs routine inspections of the landfill and issues a report. This report documents any deficiency that they believe needs to be addressed, including, perimeter fence repair, filling in of tire ruts and rodent holes, signage, etc. GHD will meet with representatives from Placer County and Regional Board at the Site and perform reasonable Site repairs as requested and approved by the City.

2.2.1.6 Stormwater Monitoring and Reporting

Stormwater Monitoring and Sampling

Inspect the Site monthly and during "normal business hours" following storm events during the rainy season. During each Site inspection, collect two sets of surface water samples (if available) for analysis.

Stormwater Reporting

Prepare the Storm Water Pollution Prevention Plan (SWPPP) forms provided by the State Water Resource Control Board. Completed forms will be submitted to the City for signature and submittal to the State Water Resource Control Board.

2.2.2 Monitoring in Accordance With CAO R5-2014-0703

Monitoring in accordance with the CAO R5-2014-0703 and the Corrective Action Work Plan.

2.2.2.1 Quarterly Monitoring of the Dewatering System

Quarterly monitoring of the dewatering system includes three components: groundwater level measurement, groundwater sampling, and remote telemetry monitoring.

Groundwater Level Measurement

Groundwater level data is to be collected in the four sumps, groundwater monitoring wells, and piezometers on a quarterly basis. These activities will be conducted in concert with the quarterly groundwater level collection for the WDR. In addition, the totalized flow, number of pump starts, energy consumed, and total hours operated is to be collected at each sump structure.

Groundwater Quality Sampling

Groundwater samples are to be collected at each sump that discharged during the quarter. Samples are to be analyzed for total dissolved solids (TDS).

Weekly Remote Telemetry Monitoring

Weekly remote monitoring of the dewatering system is required to verify that the pumps are operating within their pre-determined ranges and there is not a significant increase in water level. The telemetry information is accessed through Instrumentation Northwest's online database software.

Reporting

An O&M report shall be prepared quarterly to document compliance with the WDR and CAO. The report shall include all operational data, groundwater level data recorded for site monitoring wells and sumps, groundwater quality data, maintenance activities performed during the quarter, etc. The report will make an assessment of whether the groundwater elevation meets the compliance elevation of 184.6 feet msl. Reports shall be approved and signed by a California licensed Professional Engineer or Geologist and completed in accordance with the CAO. Reports shall be submitted to the City for review five days prior to submittal to the RWQCB. Reports are due to RWQCB 30 days following the completion of the quarter (i.e., January 30, April 30, July 30, October 30). Reports shall be uploaded to Geotracker and emailed to the electronic mail box for the Central Valley Water Board's Sacramento office at centralvalleysacramento@waterboards.ca.gov

3. Quality Assurance and Quality Control

GHD firmly believes that quality assurance (QA)/quality control (QC) is essential in delivering the consistent quality service expected by our clientele. Measures taken to promote excellent quality in project execution include direct project responsibility by Principals, and the use of in-house and external training programs. GHD is registered under the ISO 9001:2008 international standard in Consulting, Engineering, and Design Services.

GHD's success at exceeding our clients' needs is evidenced by the high percentage of repeat business that GHD enjoys with many long-term clients and by the results of client feedback questionnaires. To date, under our QS (ISO 9001:2008) client feedback survey, 97 percent of respondents have indicated GHD's overall performance was Good or Excellent, and 98 percent have indicated GHD met or exceeded their expectations. GHD is extremely proud of its demonstrated success at meeting or exceeding clients' expectations. QA/QC will be provided by Greg Barclay, PG and/or Steve Wilsey, CHMM. Brief biographies of the team are located in section 5.2 and full resumes are included in Appendix A.

4. Related Project and Client Information

A selection of brief project summaries follows. Additional details and projects can be provided upon request.

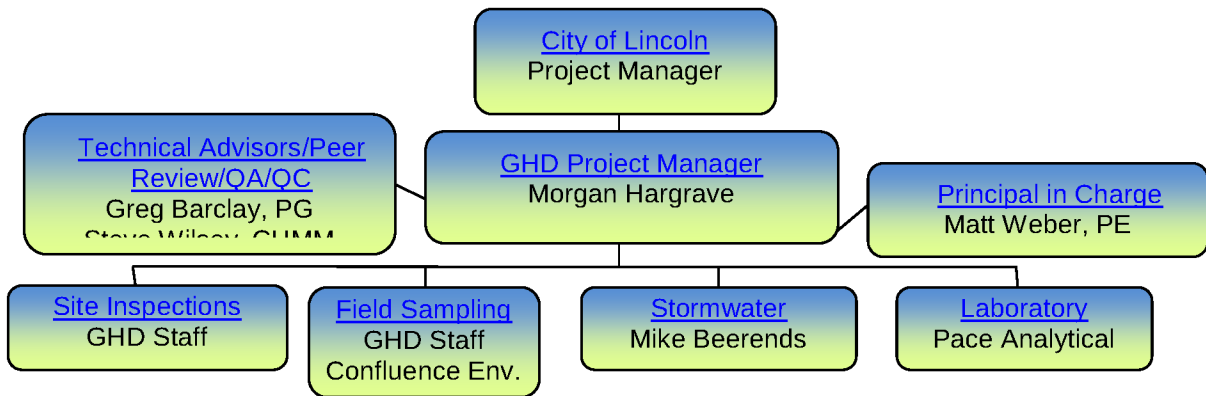
	<p>Inyo County Landfill Inyo, CA</p> <p>GHD provided monitoring and reporting for six landfills located in the 10,000-square-mile area of Inyo County in accordance with Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements and RWQCB-issued Monitoring and Reporting Plans. GHD also provided a statistical evaluation of inorganic groundwater quality results to monitor for indications of potential releases at one of the landfills, documented incoming waste to show the distribution of the types of waste as well as the wastes diverted from the landfill for recycling purposes. GHD also annually documented that financial assurance had been provided for closure, post-closure, and for potential releases for each landfill.</p> <p>Client: Minshew Engineering Contact: Wendell Minshew, PM (530) 672-1245, wendell@minshewengineering.com Disciplines: Environmental Value of Services: \$462,950</p>
	<p>Anderson Landfill, Anderson CA</p> <p>The landfill occupies approximately 125 acres of a 260-acre site. The soil at the site is highly erosive, dispersive, and expansive clay, and the site has significant topographic relief. The soil and topography resulted in distress to the site's roadway and drainage systems. GHD provided a variety of services for the access road project, including geotechnical testing, slope stability analysis of the site development features, including detention basins, design and installation of leachate pump, drainage analysis to size the proposed road culverts, grading and drainage plans, and retention design. GHD also performed erosion control engineering, determined earthwork volume calculations, conducted hydrology and hydraulics analysis, and prepared calculations for public agency reporting.</p> <p>Client: Waste Management Contact: Javed Khan, PM (916) 294-4021, jkhana@wm.com Disciplines: Civil, Environmental, Geotechnical, Survey Value of Services: \$255,310.46</p>
	<p>Union Mine Perimeter Gas Wells Placerville, CA</p> <p>The historic gold mine shafts, tunnels, and mill sites developed in the mid-1800s through early 1900s underlay the more current landfill waste disposal site causing surface water contamination. Services included the closing of the mine shafts and tunnels, designing the landfill cap, monitoring construction, and installation of LFG monitoring probes. GHD designed a mine tunnel plug, mine shaft capping structures, and the landfill cap for site closure under State of California Title 27 requirements. We also provided construction quality assurance testing, observation, and documentation for the cap placement.</p> <p>Client: Greg Stanton Contact: Greg Stanton, Director (530) 621-5300, greg.stanton@edcgov.us Disciplines: Geotechnical Value of Services: \$77,549</p>

5. Individual Staff Experience and Project Organization

GHD's local staff experience related to monitoring projects is extensive and they are supported by senior technical personnel with related experience in all components of solid waste management.

5.1 Project Organizational Chart

For this project, we are proposing the team identified in the Organizational chart below.



5.2 Key Staff

We offer these brief biographies for each key team member. Full resumes are in Appendix A.

MORGAN HARGRAVE | PROJECT MANAGER

B.S., Environmental Science, University of California, Riverside, 1996.

Mr. Hargrave possesses skills that give clients confidence that their projects are being carefully managed to realize scope, schedule, and safety goals. Effective procedure development and reporting, targeted communication, good organization and excellent people skills. His work history spans 18 years in the environmental field and experience areas encompass environmental assessment, investigation, monitoring, remediation and reporting. Mr. Hargrave is an important liaison with regulatory agencies especially in cases where regulatory orders/directives are involved. Morgan's focus is on maintaining compliance and looking for opportunities to reduce monitoring and reporting requirements through regulatory negotiation. He delegates, oversees, and manages staff work and subcontractors, while developing and tracking scopes, schedules and budgets. Mr. Hargrave's hand-on experience earlier in his career with groundwater monitoring and sampling procedures, QA/QC protocol, equipment and maintenance, along with his familiarity with the specific regulations and hydrogeologic environment associated with this project makes Morgan a well suited PM.

MATT WEBER, PE | PRINCIPAL IN CHARGE, QA/QC

B.S., Civil Engineering, Santa Clara University, 1989, M.B.A., University of California, Davis, 2000. CA Professional Engineer Civil.

Mr. Weber has more than 25 years of experience in engineering for municipal throughout the state of California, with particular focus in the Central Valley and Foothill regions. He has experience in all phases of project execution, from feasibility and planning through permitting, design and construction serving as both Project Manager and Principal in Charge. As Principal in Charge, Matt will provide general oversight and corporate support, providing whatever is needed to meet the City's goals. Experienced in environmental compliance projects and in coordinating with numerous state and local agencies, he is the Managing Principal of GHD's Sacramento office. Mr. Weber is focused on successful project delivery, and is readily available to meet with the City.

STEVE WILSEY | TECHNICAL ADVISOR

BS Biology Alfred University 1988, Certified Hazardous Materials Manager

Mr. Wilsey has over 27 years of professional experience in the solid waste field across North America. Steve is involved in all aspects of projects including feasibility studies, development, siting, permitting, environmental impact, design, construction oversight and operations. He has been involved with all types of solid waste facilities including landfills, transfer stations, hazardous waste treatment, storage and disposal facilities, recycling centers, landfill gas-to-energy plants, waste-to-energy and alternative waste processing facilities. Mr. Wilsey has completed feasibility studies for transfer stations, anaerobic digesters and alternative waste management facilities that included collection, hauling and processing

of waste streams. Steve is available to the City to consult on matters related to landfill design and ongoing compliance as the need arises.

GREG BARCLAY, PG | PEER REVIEW

B.A., Geology, San Jose State University 1981. CA Registered Professional Geologist, 1995.

Mr. Barclay has more than 35 years of environmental consulting experience and has demonstrated outstanding technical expertise and senior project oversight. Greg specializes in managing technical aspects of projects, building and leading cross-office and cross-functional project teams, providing guidance to project managers regarding high profile and technically complex sites, and understanding client's expectations. As Project Manager, Greg has been involved in numerous sites involving regulatory orders/directives including Cleanup and Abatement Orders, and working directly with the RWQCB and other agencies on behalf of the client to meet compliance requirements and if warranted modify these requirements. The projects included performing groundwater sampling, monitoring and reporting.

MIKE BEERENDS, QSP/QSD, QISP | STORMWATER

B.S., Civil/Environmental Engineering, University of Iowa, 2005.

Mr. Beerends is a civil/environmental engineer and has worked in the environmental consulting field for more than 11 years. He has worked on several SPCC plans and SWPPPs for facilities throughout California and has extensive experience with WDRs as well as groundwater monitoring, reporting, and remediation projects for sites in California, Oregon, and Nevada. Currently, Mr. Beerends is involved on coordinating and conducting field activities for several projects that are under WDRs, cleanup and abatement orders and/or pending administrative civil liabilities from the California Water Quality Control Board.

5.3 Subcontractors

GHD has established a strong network of technically qualified, safe, and competitively-priced subcontractors across North America. Our subcontracting procedures are also part of GHD's ISO 9001:2008 Quality Management System, which provides a process for verifying that all subcontractors meet the necessary technical, safety, insurance, integrity, and other related requirements to satisfy the specific needs of the client and project.

5.3.1 Groundwater Monitoring and Sampling

For completing groundwater well monitoring and sampling portions of the scope of work, GHD will utilize Confluence Environmental, Inc. (Confluence). With extensive and innovative environmental field service experience, and custom built rigs made for groundwater monitoring and sampling, Confluence offers a broad range of expertise to keep jobs running safely, smoothly, and efficiently. Confluence has wide-ranging sampling experience on some the most complex and highly scrutinized sites in California.

Point of contact for Confluence is as follows:

Mr. Jason Brown, President Confluence Environmental, Inc.
6821 8th Street, Rio Linda, CA 95673 Phone: (916) 759-8156

The percentage of the project cost associated with Confluence Environmental is 9%

5.3.2 Analytical Services

For completing groundwater sample analytical testing, GHD will utilize Pace Analytical Services, Inc. (Pace). Pace is an industry-leading analytical testing firm with 37 years of experience. Pace's local Davis location is a NELAC accredited analytical laboratory specializing in the testing of water, soil and air samples for volatile organics, semi-volatile organics, anions, metals and Chromium VI, and can easily accommodate all analytical testing requirements required for the scope of work. Routine courier service ensures all samples make it safely to the lab.

Point of contact for Pace is as follows:

Mr. Jason Jude Pace Analytical Services, Inc.
2795 2nd St. #300 Davis, CA 95618 Phone: (530) 297-4800

The percentage of the project cost associated with Pace Analytical is 10%

5.4 Staff Commitments

Senior GHD support staff are always available for supplementary technical expertise. GHD ensures that staff assignments for long-term projects (3-year term) such as the Closed Lincoln Landfill Project maintain continuity in liaison with the client and regulatory authorities having jurisdiction. Departure, reassignment, or substitution of any named member of the designated project team, including subcontractors, will not be made without the prior written approval of the City.

6. Cost Proposal

GHD's cost proposal is detailed in a sealed envelope labelled "ENGINEERING SERVICES COST PROPOSAL – CLOSED LINCOLN LANDFILL MONITORING PROJECT" as described in the RFP.

7. Exceptions

7.1 Potential Additions

None identified currently. Should additional out of scope work be required due to an update of the WDR, monitoring plan, or a minor repair at the landfill, GHD, if requested, will work together with the City to develop a scope of work and associated cost for City approval.

7.2 Standard Agreement for Professional Services

GHD reviewed the City of Lincoln's example Contract for Services and does not require any changes to the template in order to conduct work for the City.

Appendices

Appendix A Resumes



Qualified (Education): Bachelor of Science (BSc) - Environmental Science

Professional Summary: Morgan possesses skills that give clients confidence that their projects are being carefully managed to realize scope, schedule, and safety goals. Effective procedure development and reporting, targeted communication, good organization, excellent people skills. His work history spans 18 years in the environmental field and experience areas encompass environmental assessment, investigation, monitoring, remediation, and reporting on chemical spills, retail petroleum facilities, bulk fuel facilities, refineries and petroleum pipeline sites throughout California, Alaska, Utah, and Washington for major oil companies. Liaison with regulatory agencies, delegate, oversee, and manage staff project work, develop and track budgets.

Project Manager

Former Berry-Hinckley Bulk Terminal | Truckee, CA

Morgan worked closely with subject matter experts to develop highly efficient and technical data analysis which avoided potential further active remediation and resulted in obtaining case closure on a non-UST site through the California Low Threat Closure Policy.

Project Manager

Chevron California and Washington Portfolios

Remotely manage environmental investigation, monitoring, remediation, and reporting of over 40 sites of retail petroleum facilities sites throughout California and Washington for Chevron Environmental Management Company. Liaison with regulatory agencies, oversee staff project work, develop and track budgets.

Subject Matter Expert

Surfactant-Enhanced Recovery

Morgan has extensive experience with single well, push-pull, surfactant-enhanced recovery (SER) treatments. Morgan with Eric Daniels, PhD, of Chevron Energy Technology Company to develop Chevron's guidance document on the use of SER treatments, which is used on environmental projects throughout the world. "Single Well Surfactant-Enhanced Recovery (SSER) to Eliminate LNAPL Recurrence", April 2010.

Work history

2007 - present	GHD (formerly Conestoga-Rovers & Associates), Waterloo, ON
2004 - 2007	Cambria Environmental Technology, Inc., Roseville, CA
1997 - 2004	Blaine tech Services, Inc., San Jose, CA

Other related areas of interest

Recognized (Certifications/Trainings)

- Hazardous Waste DOT/RCRA Training, 2011
- OSHA 40-hour Hazardous Waste Worker, 1997 (Refreshed annually)
- OSHA 8-hour Hazardous Waste Supervisor, 1998

Published Reports

- "Corrective Action Report - Former Berry Hinckley Bulk Terminal 206470", February 5, 2013, prepared for Chevron Environmental Management Company, Project No. 311608
- "Updated Work Plan for Site Assessment", August 10, 2015, prepared Chevron Environmental Management Company, Project No. 622078

Presentations

- "Using Surfactant As A Low Cost LNAPL Elimination Strategy", Chevron Technology Transfer Workshop, October 14, 2009



Curriculum Vitae

Matt Weber, PE Principal in Charge



Qualified. B.S., Civil Engineering, Santa Clara University, 1989;
M.B.A., University of California, Davis, 2000

Connected. Member of American Society of Civil Engineers; Society of
American Military Engineers; American Welding Society

Relevance to project. Mr. Weber has over 23 years of civil engineering
experience that includes engineering with an emphasis in planning, design and
construction support services for site infrastructure and site development and
municipal infrastructure including site paving and grading, land development,
roadway design, various water, sewer and storm drain projects, and fueling
systems.

California Department of Corrections and Rehabilitation, California Health Care Facility, Design Build Package 1 | Stockton, CA, USA

Mr. Weber was Project Manager for this Design
Build project to construct the nearly \$1 Billion
California Health Care Facility. GHD was the lead
civil engineer for the Bid Package 1 that included
the unsecure facilities and site infrastructure
improvements for the new facility. GHD was
responsible for the site grading, site and perimeter
fencing and security systems, and new utility
systems including natural gas, electrical, storm-
water storage and pumping, domestic and fire
water storage and distribution, and wastewater
collection and disposal.

Lead Engineer

California Department of Corrections and Rehabilitation, Demolition, Abatement and Site Logistics Improvements for California Health Care Facility | Stockton, CA, USA

As the lead engineer for this project, Mr. Weber is
directing GHD's efforts to prepare plans, speci-
fications and estimate for the demolition and abate-
ment of the former Karl Holton Youth Correctional
Facility as well as for the site preparation for the
subsequent bid packages to construct site
improvements and buildings for the health care

facility. CDCR plans to construct the new Cali-
fornia Health Care Facility (CHCF) at the site of
the existing Karl Holton Facility at the Northern
California Youth Correctional Center in Stockton.
The scope of work includes

- Abatement PS&E for all hazardous
materials in buildings
- Demolition of all buildings
- Site improvements within the outer fence
including utility distribution lines and site.

California Department of Corrections and Rehabilitation, El Paso De Robles Repurposing Project, Estrella Correc- tional Facility | Paso Robles, CA, USA

As the site engineers for the project, Mr. Weber is
Project Manager for GHD's site engineering
design effort for this \$100M project to convert the
El Paso De Robles youth Correctional Facility to
an adult male Level II prison. The scope of work
for the conversion of the facility includes a lethal
electrified fence, new guard towers, sally ports,
interior control fencing and the addition of new
support buildings including new health care
buildings. Infrastructure improvements will include
the upgrade of roads, parking, recreation yards,
site grading, site lighting and storm drainage
improvements as well as improvements to the
prison's electrical supply and distribution system
and water and wastewater supply and storage
improvements.



Curriculum Vitae

Other related areas of interest

- **Registered.** Civil/CA/ C051921
- **Memberships.** Member of Society of Military Engineers

Principal-in-Charge and Project Manager California Department of Corrections and Rehabilitation, Statewide Archi- tectural/Engineering Services | Statewide, CA, USA

Planning, design and construction management of various building and utility infrastructure for new prison construction and expansion of existing adult and juvenile correctional facilities within the State system. Projects include a \$2 million upgrade of the water treatment plant for the Sierra Conservation Center (Jamestown) and a new boiler for the California Correctional Institution (Tehachapi). Other projects include several civil and reproofing designs at the Stockton CYA and new Small Management Yards at four separate facilities, i.e., R.J. Donovan Correctional Facility (San Diego), Mule Creek State Prison (Ione), CSP Solano (Vacaville) and Wasco State Prison.

Project Manager CDCR, Site Infrastructure Assessments Services | Statewide, CA, USA

Project Manager for engineering support, site assessment and infrastructure planning consulting services in support of constructing new medical and mental health facilities at multiple existing prison sites in California. GHD provided technical support services for site assessment of 3 existing Department of Corrections and Rehabilitation facilities:

- California Institution for Men, Chino, Ca
- Ventura Youth Correctional Facility, Ventura County
- Fred C. Nelles Youth Correctional Facility, Whittier, Ca

GHD's assessment included analysis of existing infrastructure at the facilities including sewer, water, storm drainage, hydrology, electrical, gas, hazardous materials, surveying, constraints analysis, and roadways. The Chino site study identified the needed infrastructure improvements for a new 1.4 million square foot health care facility that would include 2,100 patient beds.

Project Manager

University of California, Davis South Entry District Utilities Project | Davis, CA, USA

Assisted with the engineering and construction management of this \$13 million roadways and utilities expansion to support campus development of a new hotel and conference center adjacent to the new Mondavi Center. The project consists of an extension of the campus 12 KV power supply and underground pipelines for chilled water supply/return mains, steam, condensate, natural gas, utility water, potable water, sanitary sewers, and storm drains. A new sewer lift station and emergency generator are included. An extension of Old Davis Road with the associated street lighting and landscaping are also included.

CDCR Wastewater Pre-screening Facility, RJ Donovan State Prison | San Diego, Ca, USA

Mr. Weber was project manager to design a wastewater pre-screening facility to bring the prison's waste discharge into compliance with the City of San Diego's requirements. GHD is providing civil, structural, mechanical and electrical engineering services to design the pre-screening facility that will remove solids from the waste stream by utilizing a combination grinder and auger system.

Project Manager

State Library and Courts Building Renovation | Sacramento, CA, USA

Assisted with the engineering and construction management for the civil improvements, utility tie-ins and survey portion of the \$34 million renovation of the State Library and Courts Building located adjacent to the State Capitol.

Project Manager

Baylink Ferry Maintenance Facility | Vallejo, CA, USA

\$20M project to design a new ferry maintenance facility for Baylink Ferries at Mare Island. Design



Curriculum Vitae

includes new maintenance float and floating docks for berthing up to 4 ferry vessels, site and utility infrastructure improvements, a fuel storage and pumping facility, and the renovation of a historic masonry structure for use as a shop and office.

Principal-in-Charge

California State University, Sacramento

Foley Hall Demolition Project |

Sacramento, CA, USA

Assisted with the engineering and construction management of the hazardous material abatement and complete demolition of Foley Hall which is a three-story dormitory built during a 1959 campus expansion.

Project Manager

MCON P-364 Bremerton Consolidation |

Naval Base Kitsap, WA , USA

Design/build project for the US Navy that included a new pier and new laboratory building. Improvements at the new pier included a road widening, a paved truck turnaround and parking area, a new concrete fixed pier, a steel transfer span, mooring dolphins for mooring an existing floating pontoon, site utilities and new utility service to the pier and pontoon. Improvements included a new 22,000 square foot lab building, site parking, site landscaping and utility connections. Site infrastructure improvements included the design of new electrical, fiber optic, telephone and fire alarm service in the project area, new utility connections for the pier and building sites.



Qualified (Education): Bachelor of Science in Geology, 1981

Connected (professional affiliations): Registered Professional Geologist, State of California, 1995; State of Nevada, Certified Environmental Manager, 2001; State of Alaska, Qualified Person, 1994; State of Wyoming, Professional Geologist, 1993; National Groundwater Association, 1990s; Groundwater Resources Association, 2014.

Professional Summary: Greg has 32 years of environmental consulting experience and has demonstrated outstanding technical expertise, project management, leadership, client relations, and negotiation skills, along with ability to mentor staff from multiple offices. Greg specializes in managing technical and financial aspects of portfolios, building and leading cross-office and cross-functional project teams, providing guidance to project managers regarding high profile and technically complex sites, and understanding client's expectations.

Account Management **Oil & Gas Client | US**

As a National Account Manager for a major oil company account across the US, Greg utilized client feedback and individual capabilities to implement program/organizational changes to meet/exceed customer expectations, provide technical standards to meet customer's expectations, attend customer meetings and technical presentations, and drive health & safety program evolution utilizing a behavior-based system. The account included retail and transportation sites, refining facilities, pipelines, and former facilities throughout the US and generated approximately \$30 MM in revenue annually.

Program Management **Oil & Gas Client | CA, OR, WA, & AK**

At retail UST and transportation sites throughout California, Oregon, Washington and Alaska for a major oil company, Greg was responsible for the technical direction of projects and reviewing technical reports, as well as managing local staff in the Sacramento Office and providing client-specific process guidance, sharing lessons learned, maintaining client scorecard, coordinating and leading monthly program-specific conference calls company-wide, and interfacing with client representatives. With a focus on site closure, he reviewed and evaluated site conditions as described in the site conceptual model to state-specific closure criteria. He is also responsible for client feedback, health and safety performance, and employee utilization.

Project Manager **Oil & Gas Client | CA**

Greg served as the project manager on over 150 retail UST and transportation sites, several former petroleum bulk plant sites as well as operating terminal facilities. Responsibilities included field activities and oversight during investigation and remediation projects, technical report preparation, and budget estimation and tracking, as well as coordination with regulators, clients, and

subcontractors. Greg developed and reviewed geologic and hydrogeologic interpretations, geologic and hydrostratigraphic cross-sections, groundwater contaminant plume maps, potentiometric surface maps for multiple aquifer systems, and reviewed aquifer testing results and interpretations. The projects included performing soil and groundwater sampling, monitoring and sparge well installation, dual-phase extraction pilot testing, corrective action plan preparation, remediation construction and oversight, compliance sampling and reporting, and site closure.

Project Geologist **Solvent Recycling Facility | Bay Area, CA**

Greg assessed the extent of solvent plume in multi-aquifer environment in the Santa Clara Valley area of CA. Activities involved continuous core soil sampling, and installation of conductor casing to isolate specific depth intervals through seven water-bearing zones. Greg compiled and analyzed soil and groundwater analytical data, created geologic cross-sections depicting water-bearing zones and associated plumes, performed aquifer testing to evaluate relationship between water-bearing zones. Appropriate remedial measures to address cleanup were coordinated with local agencies and the State Water Resources Board.

Project Manager **Specialty Products | Hayward, CA**

Greg performed site assessment and remediation of a solvent plume at a specialty coating and packaging products company in Hayward, CA. Site assessment activities were performed around active site operations. Remediation involved excavation of approximately 2,500 cubic yards of soil and disposal of impacted soil. Given operations at the site could not be interrupted, coordination with client personnel and subcontractors, including excavators and soil haulers was performed prior to job initiation and on a daily basis thereafter. The project was performed on time with no disruption to site operations.



Project Coordinator

Oil & Gas Terminals | Sacramento, CA

Working with three responsible parties and the RWQCB, Greg managed assessment of three adjacent terminals in Sacramento area, involving commingled plume. Assessment activities included definition of hydrocarbons in soil, vapor, and groundwater using soil borings, vapor probes, and monitoring wells. Utilizing groundwater data from all three sites, quarterly monitoring and sampling costs were significantly reduced by selecting source zone and perimeter wells to evaluate trends over time and verify plume definition. Remediation of hydrocarbons included installation of a sparge system, removal of light non-aqueous phase liquid (LNAPL) from recovery wells and persulfate injection/removal of LNAPL in wells containing LNAPL. Activities were conducted on active terminal facilities requiring coordination with ongoing operations, traffic control, and utility locations.

Project Manager

Municipality | Bay Area, CA

Greg managed site assessment and remediation at various sites owned by the City of Santa Clara, CA involving hydrocarbon and solvent impacts to soil and groundwater at maintenance yards and golf course. Remedial measures completed at golf course included excavation of impacted soil, field testing and soil segregation, composite soil sampling, aeration of soil in coordination with air district regulation. Expedited removal and disposal of soil and excavation and transport management minimized impact to the golf course.

Project Geologist

Semi-Conductor Company | SF Bay Area

Greg performed site assessment, including well installation and sampling for large semi-conductor company in the San Francisco Bay Area, CA, at multiple active facilities over an approximate 2-year period. The solvent plumes resulted from leaks in pipelines and/or underground storage tanks. Given the plume constituents were of varying density, wells were screened at various depths and sampled for specific constituents. Involved working in secure areas, coordinating work with facility managers, and setting up exclusion zones while performing soil sampling and monitoring well installation.

Project Manager

Oil & Gas | Oakland, CA

Greg managed large soil cleanup at a former retail service station in Oakland, CA involving excavation, removal and disposal of approximately 6,000 cubic yards of hydrocarbon impacted soil. Upon completion of site assessment activities defining the extent of

excavation, a remedial construction company was contracted to excavate soil to a depth of approximately 20 feet deep using a large excavator. Given site was in a residential/commercial, traffic planning, security and oversight of pedestrian traffic was of utmost importance. Greg oversaw backfilling of pit using clean backfill and verified compaction requirements were met. No incidents occurred.

Project Geologist

High-Tech Equipment Company | San Jose, CA

Greg performed assessment of solvent plume including TCE and TCA at active high tech company in San Jose, CA. Work involved multi-depth groundwater sampling, installation of well screen in multiple water-bearing zones, aquifer pump testing, installation groundwater pump and treat (GWPT) system utilizing an air stripper for cleanup, maintenance and compliance sampling of GWPT system, reporting, coordination with air quality management and Santa Clara Valley Water District. Work was coordinated with facility personnel to minimize disruption to active operations and work areas delineated for worker and site personnel safety.

Project Geologist

Insurance Companies | San Mateo, CA

Greg performed landslide investigation and oversaw repair in San Mateo, CA involving ten residences. Investigation included monitoring surface cracks, excavation and logging of test pits to identify depth of landslide shear plan, and drilling borings. Repair included installation of surface drainage control, and installation of large diameter soldier beam walls to depths of 45 feet. Requested and assessed subcontractor bids, prepared reports for insurance companies, provided soil data for engineering design of soldier beam walls and updated city on status of landslide activity and repair. Landslide repairs were successful and residences were able to continue to live in their homes.

Project Geologist

Residential | San Jose, CA

Performed landslide investigation in east foothills area of San Jose, CA involving distressed foundations on six residences. Greg installed and monitored 4-inch diameter slope indicator casing and measured distress to casing using a slope indicator, monitored cracks in foundations and completed drainage control and underpinning of foundations where necessary. Analyzed aerial photographs using stereoscope to help assess surficial extent of landslide and prepared reports. Five of the six residences were saved.



Work history

2008 – present	Associate, GHD (formerly Conestoga-Rovers & Associates), Rancho Cordova, CA Named Associate, 2013
2004 – 2008	SAIC, Sacramento, CA
1997 – 2004	SECOR International Inc., Rancho Cordova, CA
1994 – 1997	Pacific Environmental Group, Inc., Sacramento, CA
1991 – 1994	RESNA (acquired AGS), San Jose, CA
1987 – 1991	Applied GeoSystems (AGS), San Jose, CA
1982 - 1987	Applied Earth Consultants, San Jose, CA

Other related areas of interest

Recognized (Certifications/Trainings)

- OSHA 40-hour Hazardous Waste Worker, Refresher, 2015
- OSHA 8-hour Hazardous Waste Supervisor, 2015
- Technology Transfer Workshops, Chevron Energy Technology Company, 2010
- Advanced Techniques of Project Management, 2006
- Root Cause Analysis / Incident Investigation (Why Tree Method), 2005
- Loss Prevention System Safety Training, 2005
- Decision Quality Improvement, Chevron Environmental Management Company, 2004
- Capital Stewardship and Organizational Capability, Leadership Roles and Behaviors, 2001
- Assessment and Management of MtBE-Impacted Sites, 1999
- 40-Hour OSHA Training, 1987
- CPR and First Aid Training, 2014



Qualified (Education): BS Biology Alfred University (1988), Certified Hazardous Materials Manager

Connected (professional affiliations): Air and Waste Management Association, Solid Waste Association of North America, New York State Solid Waste Management Association

Professional Summary: Mr. Wilsey is a Principal with GHD and has over 27 years of professional experience in the solid waste field across North America. He is involved in all aspects of projects including feasibility studies, development, siting, permitting, environmental impact, design, construction oversight and operations. He has been involved with all types of solid waste facilities including landfills, transfer stations, hazardous waste treatment, storage and disposal facilities, recycling centers, landfill gas-to-energy plants, waste-to-energy and alternative waste processing facilities. Mr. Wilsey has completed feasibility studies for transfer stations, anaerobic digesters and alternative waste management facilities that included collection, hauling and processing of waste streams.

Renewable Energy

Project Manager

Confidential Client | Multiple Locations, New York

- Title V permitting and building design for five landfill gas-to-energy plants in New York State. Air permitting, including New Source Review and Prevention of Significant Deterioration dispersion modeling and permitting. Modifications to existing and new Title V air permits for each facility. Projects ranged in size from 3.2 to over 18 MW of electricity.

Project Manager

Confidential Client | Multiple Locations

- Design and construction of multiple landfill gas-to-energy projects in Virginia (two), Florida, Texas, Arkansas, Oregon (two), Tennessee, Nevada, Michigan (three), Illinois, Ontario, CN, and Quebec, CN. Projects included permitting; construction administration; and design of electrical and electrical interconnect, process, mechanical-structural, civil and landfill gas interconnect elements. Total electrical generation of approximately 90 MW of electricity using both turbines and reciprocating engines. Plants ranged in size from single engine container plants to eight engine plants and a three-turbine facility.

Project Manager

Confidential Client | Michigan

- Project Manager for the design of a biological hydrogen sulfide treatment facility for the treatment of up to 10,000 CFM of landfill gas prior to use of the gas as a fuel for renewable energy production. Design included detailed structural, mechanical, and electrical engineering.

Project Manager

Confidential Client | Multiple Locations

- Project Manager and senior reviewer for multiple feasibility projects to determine the potential for the utilization of landfill gas for on-site utilization, off-site medium Btu fuel, and flaring for the generation of greenhouse gas (GHG) credits.

Solid Waste

Project Manager

Confidential Client | New York

- Project Manager for the design of a landfill gas collection system that utilizes a series of four centrifugal blowers driven by variable frequency drives controlled by a process logic control (PLC) system. The system, which can be operated remotely, is designed to maintain a set vacuum on the landfill and direct collected gas to a series of up to three control devices based on the amount of gas available. The system is designed to handle over 10,000 CFM of landfill gas.

Project Manager

Confidential Client | Ontario

- Project Manager for the monitoring and balancing of a landfill gas collection and control system consisting of 55 landfill gas wells and two 2,000-cubic foot per minute enclosed flares and leachate collection systems. Project includes monthly monitoring and maintenance of gas and leachate collection systems; balancing of the system in preparation for a high Btu utilization facility; functional analysis of gas and leachate collection systems; and development of a software program to manage monthly data using a geographically based data management package to allow for the trending, contouring, and tracking of data to optimize performance of the system.



Project Manager

Confidential Client | Pennsylvania

- Project Manager for the temporary operation of a 7,000-cubic foot per minute landfill gas collection and control system consisting of multiple enclosed and open flares and an off-site medium Btu power project. The project consisted of initial operation of the gas collection and control system, assistance in hiring and training the client's staff, and properly balancing the system to allow for maximum gas collection and odor controls. Once GHD trained new staff, operation of the system was transferred over to the client.

Project Manager

Confidential Client | Ohio

- Project Manager for the design of a gas collection and control system and air permit modification for a 10-million cubic yard landfill expansion. The system was designed to control odors, maximize landfill gas collection, and deliver landfill gas to a third party high Btu plant. GCCS was designed to accommodate pneumatic pumps at all well locations to manage liquids.

Project Manager

Confidential Client | New York

- Project Manager for the air, landfill gas, and leachate recirculation aspects of 31 million ton landfill expansion that included the addition of a landfill gas-to-energy project. Project involved an air emission inventory for the life of the landfill and dispersion modeling for air toxics and criteria pollutants. Air quality portions of DEIS, Title V application, GCCS and leachate recirculation systems design. Included evaluation of leachate collection system for compatibility with recirculation including HELP model analysis.

Project Manager

Confidential Client | New York

- Project Manager for air, landfill gas, and leachate recirculation aspects of 14 million cubic yard landfill expansion that included the addition of a landfill gas-to-energy project. Project involved an air emission inventory for the life of the landfill and dispersion modeling for air toxics and criteria pollutants. Completed GCCS and leachate recirculation systems design. Included detailed analysis of landfill moisture field capacity and functionality of leachate collection system and gas collection system with recirculation.
- Included environmental impact statement, air permitting, system design, monitoring, recordkeeping, reporting and contingency plans, and associated portions of the environmental impact statement.

- Provide ongoing support for leachate treatment system, landfill construction CQA, Title V, NSPS compliance on an as-needed basis.

Project Manager

Kenai Borough | Alaska

- Project manager for the evaluation of alternative leachate treatment methods and feasibility study for multiple on-site versus off-site leachate treatment and disposal options.

Project Manager

Confidential Client | New York

- Provided technical support for several landfills regarding the design, construction, and proper operation of gas collection systems utilizing up to 24,000 CFM of landfill gas. Provide routine review of monthly data, recommendations for adjustments, evaluation of alternative operating scenarios, and agency correspondence.

Project Manager

Confidential Client | New York

- Designed and implemented a study at a large municipal solid waste landfill which encompassed determination of the impact of fugitive emissions via emission isolation flux chamber sampling, dispersion modeling, and ambient sampling. Project included community awareness meetings with the local public and training of local health department personnel for sample collection during odor events. Actual data was compared to modeled data (ISCLT) from flux chamber samples to evaluate trends, causes, and risk evaluation to determine compliance with health-based guidance values.

Project Manager

Confidential Client | Pennsylvania

- Project Manager for the conceptual GCCS layout for a 140-acre landfill in Pennsylvania. The landfill has a third party energy project and wants to maintain operation of the GCCS and deliver gas to third party at point of sale. Project includes dewatering of leachate mound within the landfill and control/blower system upgrades.

Project Manager

Confidential Client | New York

- Developed an environmental management system for a landfill client to comply with state and federal air quality regulations. Project included tying various permits into a compliance manual followed by establishing recordkeeping and reporting systems for gathering data. Program was implemented by establishing an overall recordkeeping and filing system for the facility, in addition to instituting personnel accountability for various records

**Project Manager****Confidential Client | New York**

- Prepared an annual reporting program for several municipal solid waste landfills that includes NSPS, MACT, and Title V reports.

Project Manager**Confidential Client | Various States**

- Assisted numerous MSW landfills with air quality issues surrounding facility expansions including: Title V, PSD, NSR, landfill gas generation modeling, regulatory applicability, and mobile sources.

Project Manager**Confidential Client | Various States**

- Performed several landfill gas testing events to determine NMOC and individual contaminant concentrations for comparison to predicted values.

Project Manager**Confidential Client | New York**

- Prepared emission inventory, Title V application/permit to construct, and air quality sections of environmental impact statement for a large municipal solid waste landfill expansion in New York State.

Lead Auditor**Confidential Client | Various States**

- Performed merger and acquisition multi-media compliance audits for municipal solid waste landfills in New York, Virginia, and Florida.

Project Manager**Confidential Client | Vermont**

- Project Manager for the building design and geotechnical investigation for a landfill gas-to-energy facility in Coventry, Vermont.

Project Manager**Confidential Client | Pennsylvania**

- Project Manager for the emissions inventory, field study, and dispersion modeling as part of a human health risk assessment at a municipal solid waste landfill in Pennsylvania. Project included landfill gas modeling, surface scan, and flux chamber sampling with field GC analysis combined with laboratory analysis to estimate emission rates for speciated landfill gas compounds.
- The project included 6-week ambient air monitoring program at and around the landfill. Developed sampling and analysis plan that was approved by PADEP, PADOH, and ATSDR. Operated network of five monitoring stations for H₂S, SO₂, PM₁₀, PM_{2.5}, and TSP. Coordinated with off-site sampling

conducted by state environmental agency and ATSDR.

- Ongoing support includes Title V permitting and reporting, NSPS and SSM reporting, operational support.

Project Manager**Confidential Client | New York**

- Project Manager and technical lead for the air permitting of a major landfill expansion and landfill gas-to-energy plant. Project included Title V permit modification, dispersion modeling for criteria pollutants and air toxics, PSD/NSR permitting, as well as BACT and LAER analysis.

Project Manager**Confidential Client | New York**

- Project Manager and technical lead for the addition of a high Btu landfill gas management project to an existing power plant. Project included air dispersion modeling for criteria pollutants, Title V permit modification, PSD/NSR permitting, BACT and LAER analysis, SEQR permitting, and agency negotiations.

Project Manager**Confidential Client | New York**

- Project Manager for the air permitting of a mine for a solid waste facility. Project required air dispersion modeling, draft environmental impact statement, and adjudicatory hearings focusing on air quality impacts. Prepared expert witness for testimony on the emissions generated from mining activities.

Project Manager**Confidential Client | New York**

- Technical lead on several common control determinations between landfill gas-to-energy developers and landfills. Assisted in the preparation of Petition for Ruling to NYSDEC and USEPA Region 2 to separate landfill from gas developer resulting in the issuance of separate Title V Permits.

Project Manager**Confidential Client | New York**

- Testified as a fact witness in Federal court in relation to the use of USEPA's LANDGEM model in an attempt to assign cost to Potentially Responsible Parties as part of a state Superfund case.

Project Manager**Confidential Client | Calgary, AB**

- Project Manager for the design of a cover system that utilized methane oxidation (meth-ox) beds for the control of fugitive landfill gas emissions from a closed landfill. Beds consisted of stone trenches leading to compost filled meth-ox beds. Project included design



and monitoring of a test meth-ox bed at an operating landfill and design of a closure plan implementing the test bed full-scale into the long-term closure of a meth-ox bed system at a landfill in Western Canada, demonstrating an 89-percent reduction in fugitive emissions. Prepared cost estimates for construction, monitoring, and oversight of full-scale closure using meth-ox beds.

Project Manager

Confidential Client | Various States

- Managed and conducted an environmental compliance training program for a solid waste client that covered over 300 personnel in 15 states from Maine to Virginia. The project consisted of developing multi-media, industry-specific material in the following subject areas: air quality, stormwater, wastewater, drinking water, special waste, facility operating requirements, EPGHD, storage tanks, and hazardous waste.

Project Manager

Confidential Client | Various States

- Completed several projects for a municipal waste combustor client with multiple facilities in the Northeast United States. Services provided included air quality compliance, compliance audits, and due diligence assessments (including Phase I and II ESAs) for existing sites and potential acquisitions. Performed Phase I ESAs and compliance audits of facilities receiving combustion ash.

Project Manager

Confidential Client | New York

- Project Manager for the development of a geographically based data collection and management system to handle data for a municipal solid waste landfill encompassing: 196 groundwater quality wells, 132 gas wells, 522 quarterly surface scan points, and 25 gas migration probes. The system allows a field technician to gather data using handheld personal computers that automatically download the data on a daily basis, enabling the future utilization of all site data and historic data.

Project Manager

Confidential Client | New York

- Project manager for the permitting of an aerobic composting facility at an existing solid waste landfill. Operation uses green and organics wastes received by the landfill to create a salable mulch product.

Project Manager

Quasar Energy | New York

- Project manager for the air and solid waste permitting for two anaerobic digesters in upstate, New York. The facilities utilize biosolids and organics waste streams

to generate methane which is used to fuel internal combustion gensets that generate electricity for sale on the open market. These are the first two private digester projects known to have been permitted in New York.

Lead Auditor

Confidential Client | Pennsylvania

- Lead auditor for a multi-media compliance audit of a kryogenic landfill gas separation project. Reviewed air, solid waste and stormwater compliance with particular focus on NSPS requirements.

Project Manager

Confidential Client | New York

- Project manager and lead auditor for multi-media compliance audits for multiple transfer stations, hauling companies and recycling facilities across New York State.

Project Manager

Confidential Client | New York

- Managed design of a \$1.4 million air pollution control system to be used for the stabilization of hazardous waste lagoons. Project included design of baghouses, blowers, and carbon adsorption systems able to treat 55,000 CFM of off-gas. Project also consisted of negotiations with regulatory agencies, ambient air quality impact evaluation, and the design of a continuous emissions monitoring system used to demonstrate compliance. Provided CQA services during lagoon stabilization followed by cap design and CQA services for capping and final closure.

Project Manager

Confidential Client | Ohio

- Project Manager for the design of an approximately 2.1 million cubic yard expansion of a construction and demolition debris landfill in Northeastern Ohio. Project included civil design, leachate collection system design, cap design, groundwater dewatering and agency negotiations.

Project Manager

Confidential Client | Texas

- Project Manager for the completion of a feasibility study evaluating the potential of constructing and operating a private waste management facility for the oil field wastes generated from natural gas hydrofracking operation in the Permian Basin.

Project Manager

Confidential Client | New York

- Project Manager for the completion a State Facility Permit Application for hazardous waste treatment and disposal facility. Following issuance of initial permit,



prepared Application for Major Permit Modification to add additional landfill space to the facility. Project included detailed air emissions inventory for waste and leachate treatment processes, leachate collection and land disposal activities. Prepared rebuttal to expert report opposing the facility.

Peer Reviewer

Richfield Landfill | Michigan

- Senior peer review for the CQA activities associated with the sideslope overliner for Cell 3D and Cell 3E (approximately 35,185 square feet). Construction activities included preparation of the subgrade layer, installation of the geosynthetic clay liner, installation of the geosynthetic membrane, placement of the geocomposite, and thickness verification of the protective sand layer.
- Senior peer review for the CQA activities associated with the sideslope overliner for Cell 3F (approximately 47,000 square feet). Construction activities included preparation of the subgrade layer, installation of the geosynthetic clay liner, installation of the geosynthetic membrane, placement of the geocomposite, and thickness verification of the protective sand layer.

Work history

2002-Present	Principal/Vice President
	GHD (formerly Conestoga-Rovers & Associates), Niagara Falls, NY
	Named GHD Principal/Vice President, 2009
	Named GHD Associate, 2005
1994-2002	IT Corporation (formerly EMCON), Tonawanda, NY
1991-1994	LaBella Associates, P.C., Rochester, NY
1988-1991	Independent Labs, East Syracuse, NY

Other related areas of interest

Publications and Presentations

- Implementation of the Clean Air Act in the Business Sector, Roundtable Discussion, Rochester, New York 1994
- Title V Permitting Issues, AWMA Niagara Frontier Section Annual Spring Environmental Seminar Planning for the Unexpected, April 1995
- Clean Air Act/Title V Permitting Update, Coltec Industries, Inc., National Environmental, Health & Safety Conference, Nashville, Tennessee, June 1996

- Technical Approach for the Assessment of Air Emissions from Municipal Landfills Using the USEPA Flux Chamber and Dispersion Modeling to Predict Off-Site Impact Potential, AWMA National Meeting, San Diego, California 1998
- Title V – Technology – Compliance and Solid Waste Landfills, AWMA Frontier Chapter Spring Conference, April 2005
- New Technologies for Electronic Data Collection and Management at a Regional Municipal Solid Waste Landfill, Engineering Society of Detroit, March 2005
- Calculating Landfill Gas Emission Rates for Solid Waste Landfill Risk Assessments, WasteTech Conference, Miami, Ohio 2007. Sarah A. Foster, Paul C. Christowski, Ph.D., Steven D. Wilsey, Ben Hoffman, MD.
- Advanced Monitoring and Balancing of Gas Collection Systems Utilizing Data Management and GIS Software SWANA 31st Annual Landfill Gas Symposium, Houston, Texas, March 2008
- The Tailoring Rule and Its Impact on MSW Landfills and Landfill Gas To Energy, Federation of New York Solid Waste Associations – Solid Waste & Recycling Conference, May 2011
- Overview of Requirements Pertaining to Reciprocating Internal Combustion Engines, AWMA Niagara Frontier Section Annual Spring Environmental Seminar, April 2011
- Dark Matter – The Hidden Tale of Variations in the Physical and Chemical Characteristics in the Universe of Landfills Federation of New York Solid Waste Associations – Solid Waste & Recycling Conference, May 2013. Andrew Lugowski, P.Eng., Duncan Miller, P.Eng., Sara Arabi, Ph.D., P.Eng., Steven Wilsey.
- Biological Nutrient Removal Process for Landfill Leachate Treatment, Global Waste Management Symposium, Orlando, Florida, June 22-25, 2014, Sara Arabi, Ph.D., P.Eng., Steven Wilsey.



Qualified (Education): Bachelor of Science Civil/Environmental Engineering, University of Iowa, 2005

Connected (professional affiliations): Natural Resources Conservation Service (NRCS), National Renders Association, Fresno County Farm Bureau, Fresno Chamber of Commerce, California Creamery Operators Association, California Grain & Feed Association

Professional Summary: Mr. Beerends is a civil/environmental engineer and has worked in the environmental consulting field for over 11 years. He has extensive experience with WDRs as well as groundwater monitoring, reporting, and remediation projects for sites in California, Oregon, and Nevada. Currently, Mr. Beerends is involved on coordinating and conducting field activities for several projects that are under WDRs, clean up and abatement orders and/or pending administrative civil liabilities from the California Water Quality Control Board. Mr. Beerends has also completed preliminary site investigations as well as Phase II site investigations for several sites in California. Additionally, he has worked on several SPCC plans and SWPPPs for facilities throughout California.

Project Coordinator

Former National Car Rental | General Motors | Portland, OR

Petroleum impacted groundwater was treated via oxygen infusion (iSOC units) on behalf of General Motors Remediation and Liability Management Company, Inc. (REALM). Project coordination and engineering responsibilities included proposal, work plan, final report and budget preparation, sampling activities, remedial system design/installation, subcontractor oversight, data analysis, permitting, local regulations adherence, regulatory agency personnel contact, client interactions, hazardous waste management, and remedial system maintenance, enhancements, and modifications.

Project Coordinator

Former National Car Rental | General Motors | Reno, NV

Petroleum impacted groundwater was treated via a pump and treat system with activated carbon media filters on behalf of General Motors Remediation and Liability Management Company, Inc. (REALM). Project coordination and engineering responsibilities included proposal, work plan, final report and budget preparation, sampling activities, remedial system design/installation, subcontractor oversight, data analysis, permitting, local regulations adherence, regulatory agency personnel contact, client interactions, hazardous waste management, and remedial system maintenance, enhancements, and modifications.

Project Coordinator

Property Redevelopment | Flowserve Corporation | Chico, CA

Responsibilities included work plan preparation and coordination which included sensitive receptor preparation, and governmental oversight coordination.

Project Coordinator

Remediation and Redevelopment | Magna Entertainment Corporation | Dixon, CA

Project included work plan preparation, contractor and regulatory agency coordination, and oversight for removal and disposal of 500 tons of diesel-impacted soils followed by remedial action reporting for a vacant lot that was being redeveloped by Magna Entertainment.

Project Manager

Rendering Facilities | Baker Commodities | Hanford and Kerman, CA

Potable water system oversight and sampling which includes chlorination and reporting to California Department of Public Health (CDPH), monitoring well installation (including contractor coordination, work plan preparation and submittal to water board for approval, and result reporting), monitoring well sampling and reporting, domestic well installation, domestic well abandonment, revised report of waste discharge (ROWD) including waste management plan and antidegradation analysis for the facility, influent and effluent monitoring and sampling, water supply sampling, monthly water board reporting to meet waste discharge requirements (WDR), nutrient management plan development, salinity control plan development, sampling and analysis plan, lagoon closure workplan of former unlined lagoons, Geotracker reporting upload to meet cleanup and abatement order (CAO) requirements, treatment option review and feasibility to meet discharge requirements.

Project Manager

Wineries | The Wine Group | Cutler and McFarland, CA

Revised report of waste discharge (ROWD) including waste management plan and antidegradation analysis for the facilities, influent and effluent evaluation, water supply evaluation, water board reporting to meet waste discharge requirements (WDR), nutrient management plan



development, salinity control plan development, groundwater investigation plan development, sampling and analysis plan, treatment option review and feasibility to meet discharge requirements.

Project Manager

WWTP | Malaga Water District | Fresno, CA

Pollution prevention plan preparation, salinity control plan preparation as well as local limits study development to meet waste discharge requirements (WDR)

Project Manager

Waste Discharge Requirements | Various Dairies | Throughout CA

Multiple projects included assisting several dairies throughout California with Waste Discharge Requirements (WDRs). Projects included compliance of the Central Valley Water Board WDRs including regulatory submissions of the preliminary dairy facility assessment and the annual reports, nutrient management and waste management reports. Coordination of dairy sampling programs included the collection of soil, plant tissue, solid manure, wastewater, and irrigation water sampling in conjunction with the WDR program.

Project Manager

Industrial Stormwater Compliance | Various Food and Beverage Clients | Throughout CA

Assisted several food and beverage clients with stormwater permitting and report preparation. Work included initial facility evaluation, preparation of the stormwater plans, inspections, and sampling.

Project Manager

SPCC | Various Food and Beverage Clients | Throughout CA

Assisted several food and beverage clients with spill prevention, control, and countermeasure (SPCC) plan preparation. Work included initial facility evaluation, preparation of the SPCC plans, and inspections.

Project Manager

CNMPs | Various CAFOs | Throughout CA

Project Coordination for the completion of an ID/IQ, A&E contract for the USDA-NRCS. Activities include landowner interviews, site investigation, survey and site data collection, contract liaison with government agency representatives, and management, quality control and assurance. After completion of the field work and data collection, waste management systems were designed to meet the requirements of the Utah USDA-NRCS and landowner goals.

Project Manager

Monitoring Well Installation | Various CAFOs | Throughout CA

Monitoring well installation at feeding operations in California. Responsibilities included subcontractor oversight, soil classification during drilling activities, single well response (slug) testing, sampling activities, and reporting.

Project Manager

Cheese Plant | Green Valley Foods | Barstow, CA

Cleanup and Abatement Order (CAO), WDR, Cease and Desist Order (CDO), and Administrative Civil Liability (ACL) assistance (litigation) for a cheese plant in California. Responsibilities included proposals, final reporting, budget preparation, sampling activities, permitting for disposal of effluent water, treatment of effluent water, and regulation adherence.

Project Engineer

On-Call | Pinal County | AZ

Engineer Intern for Pinal County On-call services included review of Signing and Striping plans for the county prior to approval. All plans were reviewed and compared to applicable standards including Pinal County standards and ADOT standards. These same tasks were performed for Traffic Impact Analyses that were submitted to the county for approval.

Project Engineer

Flood Mapping | Santa Cruz County | AZ

Engineer Intern on the Santa Cruz County map modernization project, responsibilities included analysis and data input into Hec-Ras, Rasplot, and Checkras.

Project Manager

Various Projects | City of Tulare | CA

Project manager for various projects for the City of Tulare including air permitting, SPCC, stormwater, and wastewater.

Work history

2009 - present	Associate, GHD (formerly Conestoga-Rovers & Associates), Fresno, CA Named Associate, 2015
2007 - 2009	C.L. Williams Consulting, Inc., Pinetop, AZ
2005 - 2007	GHD (formerly Conestoga-Rovers & Associates), Stockton, CA



Other related areas of interest

Recognized (Certifications/Trainings)

- Engineer In Training (EIT)
- Technical Service Provider (TSP-10-6562)
- RCRA/DOT Hazardous Materials Transportation
- OSHA Hazardous Communication
- OSHA 40-hour Hazardous Waste Operator, 2005

Presentations

- Stormwater Pollution Prevention Plan Presentations throughout California

Appendix B

Example Documents



March 2, 2016

Reference No. 310673

Ms. Kristin Shelton
Regional Water Quality Control Board (RWQCB)
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, California 95670 6114

**Re: First Semi-Annual 2016
Groundwater Monitoring Report
Client Confidential
Sacramento, California
CAO R5 2008 0706
MRP R5 2013 0807**

Dear Ms. Shelton:

GHD Services Inc. (GHD) is submitting this First Semi-Annual 2016 Groundwater Monitoring Report for the site referenced above on behalf of *Client Confidential*. This report is prepared in accordance with requirements set forth in Cleanup and Abatement Order (CAO) R5 2008 0706 and Monitoring and Reporting Program (MRP) R5 2013 0807. Site background information, a summary of previous investigation, current quarter monitoring results and remedial activities, GHD's conclusions and recommendations, summary of hydrocarbon trends, and anticipated future activities are discussed below.

1. SITE BACKGROUND

Site Description

The site is an active *Client Confidential* Fuel Terminal located in close proximity to the eastern bank of the Sacramento River at 2420 Front Street in Sacramento, California (Figure 1). The site consists of a fuel terminal (terminal) and a former *Client Confidential* terminal (surplus parcel) that is currently a vacant lot to the northwest of the site, separated from the active site by the Southern Pacific Railroad.

A ConocoPhillips (CoP) terminal (formerly Unocal) is located south of the site across Broadway and a former TOSCO terminal is located west of the terminal and south of the surplus parcel (Figure 2). The elevated Interstate 5/Business 80/Highway 50 interchange is located adjacent to the northern and eastern property boundaries.

Current facilities at the terminal consist of 13 aboveground storage tanks (ASTs) ranging in size from approximately 2,600 to 50,000 barrels. The terminal also contains an office, a maintenance building/motor transport building, and covered tank truck loading islands (Figure 2).

The surplus property was operated by *Client Confidential* from at least the 1950s to the late 1960s and once contained five ASTs and a wharf (Figure 2). All structures were removed from the surplus property between 1971 and 1981 (Figure 2).

The railroad separating the terminal and the surplus property was historically used for fuel transfer operations, but is now used by the California State Railroad Museum for recreational passenger train rides. There is also a public walking/bike path along the railroad that is maintained by the City of Sacramento. The railroad and path are within an easement and are not *Client Confidential* property.

The active portion of the site has been operating as a fuel terminal since at least 1930. It is the primary fuel supply for *Client Confidential* and independent fuel retailers for most of the Sacramento Valley and Tahoe regions.

Three hydrocarbon source areas have been identified onsite:

- Area of the ASTs (well MW 46)
- Area of the motor transport building (well B 7)
- Area of the former oil/water separator near the southeast corner of the site (well MW 45)

Site Geology

The site is relatively flat at an approximate elevation of 15 feet above mean sea level (msl). Soils encountered beneath the site are fairly consistent across the site. Silt with relatively low estimated permeability is encountered from the ground surface to approximately 10 feet below grade (fbg) and is underlain by silty sand to approximately 20 fbg (with some local variation). Sediment grain size is primarily fine but increases to coarse sand at approximately 78 fbg. Silty and sandy gravel is encountered from 78 fbg to approximately 80 fbg. Relatively stiff silt to clayey silt with low estimated permeability (likely an aquitard) is encountered at approximately 82 to 88 fbg and extends to the maximum explored depth of approximately 114 fbg. Based on observations obtained from continuously collected soil cores, the aquitard is a minimum of 8 feet thick and may be in excess of 26 feet thick.

Site Hydrogeology

The terminal is located just east of the Sacramento River. Measured depth to water has historically ranged from 0 (artesian) to 29 fbg since groundwater monitoring began in 1987. A representative hydrograph for select wells shows that seasonal groundwater level fluctuations typically range from approximately 2 to 15 feet, with the highest levels in late winter and early spring, and lowest levels in late summer and early fall (Figure 3). Flowing artesian conditions have occurred at times when the Sacramento River has approached flood stage. Generally, the groundwater gradient beneath the site is relatively flat and groundwater flows to the east, away from the Sacramento River.

2. PREVIOUS INVESTIGATION AND REMEDIATION ACTIVITIES

Numerous investigations and remedial activities have been performed at the site beginning in 1982. To date, 59 monitoring wells, 4 tank backfill wells, 41 vapor extraction wells, 36 groundwater oxygenation wells, 14 light non-aqueous phase liquid (LNAPL) wells, 21 soil borings, 31 soil vapor

probes, 1 recovery well, 1 surfactant extraction well, and 4 cone penetration test borings have been advanced and/or installed at the site. Well construction details are presented in Table 1. Quarterly groundwater monitoring of site wells was initiated in 1987 and continued through 2013. Semi-annual monitoring was initiated in 2014 and is ongoing. Remedial activities include groundwater extraction, soil vapor extraction, groundwater oxygenation, LNAPL bailing, ozone sparging, and surfactant enhanced recovery.

3. RESULTS OF FIRST SEMI-ANNUAL 2016 MONITORING EVENT

Semi-Annual Groundwater Monitoring and Sampling

On January 5 through 6, 2016, Gettler-Ryan Inc. (G-R) gauged all onsite wells, checked for LNAPL, and collected groundwater samples from select wells per the MRP.

The adjacent TOSCO/Tidewater fuel terminal was also monitored and sampled by G-R on January 5 and 6, 2016. The adjacent CoP terminal has been designated for semi-annual sampling during the second and fourth quarters and data from this site will no longer be included in these monitoring reports.

G-R's *Groundwater Monitoring and Sampling Data Package* is included as Attachment A. Current groundwater monitoring and sampling data are presented in Table 2. Eurofins Lancaster Laboratories' *Analytical Results* are included as Attachment B. Historical groundwater monitoring and sampling data are included as Attachment C. Current and historical groundwater monitoring and sampling data for the adjacent TOSCO/Tidewater fuel terminal are included as Attachment D.

During the first quarter 2016, depth to groundwater in site wells ranged from approximately 10 to 28 fbg, and groundwater elevations ranged from approximately 3.5 to 7 feet above mean sea level (msl). Groundwater flow direction was generally towards the east-southeast although variable at a relatively flat gradient across the site (Figure 4). Current and historical groundwater flow direction and gradients are presented in Table A below. Historical groundwater elevation data are included in G-R's monitoring and sampling tables (Attachment C).

Table A Groundwater Flow Direction and Gradient

Quarter	Flow Direction	Gradient	Quarter	Flow Direction	Gradient	Quarter	Flow Direction	Gradient
2Q96	E to SE	0.003	4Q02	SE	0.002	4Q08	E to NE	0.0004 to 0.02
4Q96	E to NE	0.002	1Q03	S to E	0.001 to 0.006	1Q09	E to Variable	0.0002 to 0.02
1Q97	E	0.005	3Q03	E	0.001 to 0.004	4Q09	E to Variable	0.0004 to 0.003
2Q97	E	0.001	4Q03	NE to E	0.002	1Q10	E to Variable	0.002 to 0.003
3Q97	E	0.003	1Q04	Variable	0.02 to	2Q10	E to	0.001 to

Table A Groundwater Flow Direction and Gradient

Quarter	Flow Direction	Gradient	Quarter	Flow Direction	Gradient	Quarter	Flow Direction	Gradient
					0.006		Variable	0.003
4Q97	E	0.001	2Q04	SE to E	0.001 to 0.002	3Q10	E-SE to Variable	0.001 to 0.005
1Q98	E	0.005	3Q04	E	0.001 to 0.004	4Q10	E to Variable	0.006 to 0.02
2Q98	ENE	0.005	4Q04	E to NE	0.0006 to 0.0009	1Q11	E-SE to Variable	0.002 to 0.006
3Q98	E	0.001	1Q05	E	0.001 to 0.004	2Q11	E-SE to Variable	0.004
4Q98	ENE	0.005	2Q05	E	0.0006 to 0.003	3Q11	SE	0.002 to 0.004
1Q99	E	0.006	3Q05	E	0.0004 to 0.002	4Q11	SE	0.002 to 0.004
2Q99	Variable	0.003	4Q05	E	0.0009 to 0.002	1Q12	SE	0.002
3Q99	ESE	0.006	1Q06	E	0.0008 to 0.015	2Q12	SE	0.003
4Q99	Variable	0.003	2Q06	E	0.0004 to 0.001	3Q12	SE	0.001
1Q00	E to SE	0.002	3Q06	E	0.007 to 0.02	4Q12	SE	0.002
2Q00	E	0.001	4Q07	E	0.008 to 0.002	1Q13	E	0.006 to 0.02
4Q00	E	0.003	1Q07	NE	0.0006 to 0.0009	2Q13	E-SE	0.01
1Q01	E	0.002	2Q07	NE	0.001 to 0.002	3Q13	E-SE	0.01
2Q01	E	0.004	3Q07	NE	0.001 to 0.002	1Q14	E-SE	0.01
3Q01	E	0.004	4Q07	NE	0.0009 to 0.002	3Q14	E to SE	0.01
4Q01	E	0.004	1Q08	NE	0.001 to 0.07	1Q15	E-SE	0.01
1Q02	E	0.004	2Q08	E	0.002 to 0.006	3Q15	E-SE	0.01
2Q02	E	0.004	3Q08	E to SE	0.001 to 0.07	1Q16	E-SE	0.01
3Q02	SE	0.004	2Q09	E to Variable	0.002 to 0.006			
2Q03	SE	0.001 to 0.004	3Q09	E to Variable	0.002 to 0.005			

Groundwater samples were analyzed for the site's constituents of concern (COCs) using the methods noted in Eurofins Lancaster Laboratories' analytical reports (Attachment B). Total petroleum hydrocarbons as diesel (TPHd), total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tertiary butyl ether (MTBE) results are summarized in Table B and discussed below.

Table B Groundwater Analytical Data First Quarter 2016 Monitoring Event

Well ID	TPHd ¹ µg/L	TPHg µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L	MTBE µg/L
WQOs	100	5	0.15	42	29	17	5
MW-2	850/<31	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-3	Monitoring Only						
MW-6	1,300/<31	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-11	Monitoring Only						
MW-13	Monitoring Only						
MW-14	Monitoring Only						
MW-15	Monitoring Only						
MW-16	Monitoring Only						
MW-17	Monitoring Only						
MW-18	Monitoring Only						
MW-19	Monitoring Only						
MW-21	Unable to Access						
MW-22	220/<30	67J	<0.5	<0.5	<0.5	<0.5	1J
MW-23	Monitoring Only						
MW-24	630/100	650	5	2	<0.5	2	2
MW-25	Monitoring Only						
MW-26	300/<31	<50	<0.5	<0.5	<0.5	<0.5	<0.5
MW-27	310/<33	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-28	Monitoring Only						
MW-29	83J/<30	<50	<0.5	<0.5	<0.5	<0.5	2
MW-30	5,500/4,200	780	<0.5	<0.5	<0.5	<0.5	4
MW-31	Monitoring Only						
MW-32	Monitoring Only						
MW-33	Monitoring Only						
MW-34	Monitoring Only						
MW-35	2,000/910	3,800	31	8	<3	<3	<3
MW-36	Monitoring Only						
MW-37	Monitoring Only						
MW-38	Monitoring Only						
MW-39	Monitoring Only						
MW-40	Monitoring Only						
MW-41	Monitoring Only						
MW-42	Monitoring Only						
MW-43	52J/<32	<31	<0.5	<0.5	<0.5	<0.5	0.6J
MW-44	2,000/140	390	<0.5	<0.5	<0.5	<0.5	3
MW-45	<50/<31	<50	<0.5	<0.5	<0.5	<0.5	<0.5
MW-46	15,000/3,900	3,300	5	<0.5	1	3	6
MW-47	Monitoring Only						

Table B Groundwater Analytical Data First Quarter 2016 Monitoring Event

Well ID	TPHd ¹ μg/L	TPHg μg/L	Benzene μg/L	Toluene μg/L	Ethylbenzene μg/L	Xylenes μg/L	MTBE μg/L
WQOs	100	5	0.15	42	29	17	5
MW-48	Monitoring Only						
MW-49	<50/<31	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-50	190 <30	<50	<0.5	<0.5	<0.5	<0.5	5
MW-51	<50/<31	<50	<0.5	<0.5	<0.5	<0.5	<0.5
MW-52	Monitoring Only						
MW-53	Monitoring Only						
B-7	3,700/960	6,900	250	25	11	38	4J
RW-100	Monitoring Only						
A-1	Monitoring Only						
A-2	Monitoring Only						
A-3	Monitoring Only						
A-4	1,300/290	360	<0.5	<0.5	<0.5	<0.5	2
A-5	Monitoring Only						
A-6	Monitoring Only						
A-7	Monitoring Only						
A-8	Monitoring Only						
A-9	Monitoring Only						
A-10	4,600/1,400	5,600	220	21	20	21	38
A-11	Unable to Locate						
A-12	Monitoring Only						
A-13	Monitoring Only						
A-14	Unable to Locate						
T-1	Insufficient water, not sampled						
T-2	LNAPL, Insufficient water, not sampled						
T-3	150,000/130,000	8,000	<5	<5	<5	<5	15
T-4	4,100/2,500	2,400	<0.5	<0.5	<0.5	<0.5	3
¹	TPHd without and with 10-gram column silica gel cleanup with capric acid reverse surrogate						
<	Indicates constituent was not detected at or above laboratory reporting limit						
NA	Not Analyzed						
μg/L	Micrograms per liter						
WQO	Water Quality Objective, Central Valley Regional Water Quality Control Board - <i>Water Quality Numerical Limits for Petroleum Fuel Mixtures, Constituents and Additives</i> , April 1, 2004						
J	Estimated value ≥ the Method Detection Limit (MDL or DL) and the < Limit of Quantitation (LOQ or RL)						
Data in bold represent concentrations that exceed applicable WQOs (Water Quality Objectives).							

Discussion of Analytical Results

- TPHd is the primary COC at the site. Consistent with past results, the highest dissolved concentrations of TPHd were reported in wells located near the area of the ASTs and former oil/water separator (Figure 5), and the downgradient extent of dissolved TPHd is defined. TPHd was reported at or above the WQO in 16 of the 21 wells sampled this quarter; however, TPHd was only detected at or above the WQO in 10 of the 21 wells using silica gel cleanup.

- TPHg exceeding the WQO was detected in 11 of 21 wells sampled. The highest TPHg concentrations were reported in wells in the area of the ASTs and former oil/water separator (Figure 6), and the downgradient extent of dissolved TPHg is defined.
- Benzene exceeding the WQO was only reported in 5 of 21 wells sampled. Benzene is localized primarily to the area of the ASTs (Figure 7), and is defined downgradient.
- MTBE was reported at or above the WQO in only 4 of 19 wells sampled, with the highest concentration (38 µg/L) in well A-10, located in the area of the ASTs (Figure 8). The downgradient extent of dissolved MTBE is defined to low levels.
- No TPHd, TPHg, BTEX or MTBE were detected in the deep well MW-45.
- No TPHg, BTEX, or MTBE were detected in the very deep well MW-51.

LNAPL Monitoring

During the quarterly LNAPL monitoring in January 2016, 0.04 feet of LNAPL was detected in monitoring well T-2. G-R bailed 0.02 liters of LNAPL and groundwater from the well.

4. Conclusions and Recommendations

Results of this groundwater monitoring and sampling event are consistent with historical results, and continue to indicate a stable or shrinking plume. The dissolved phase hydrocarbon plume is adequately defined downgradient and vertically. Hydrocarbons in groundwater are primarily limited to the areas of the former oil/water separator and AST area, and to a lesser extent, to the motor transport building (Figures 5 through 8). GHD recommends continued monitoring and sampling of site wells to evaluate dissolved hydrocarbon concentrations and extent over time.

5. Anticipated Future Activities

Semi-Annual Groundwater Sampling

G-R will gauge and sample select site wells during the third quarter 2016 monitoring and sampling event. Upon completion of this monitoring event, GHD will prepare a summary of the site conditions and monitoring results.

We appreciate working with you on this project. Should you have any questions on the above, please do not hesitate to contact Brian Silva at (916) 889-8908.

Sincerely,

GHD

BJS/de/39

Encl.

Figure 1	Vicinity Map
Figure 2	Site Plan
Figure 3	Hydrographs for Selected Wells
Figure 4	Groundwater Elevation Map
Figure 5	TPHd Concentrations in Groundwater
Figure 6	TPHg Concentrations in Groundwater
Figure 7	Benzene Concentrations in Groundwater
Figure 8	MTBE Concentrations in Groundwater

Table 1 Well Construction Specifications

Table 2 Groundwater Monitoring and Sampling Data

Attachment A	Monitoring Data Package
Attachment B	Laboratory Analytical Reports
Attachment C	Historical Groundwater Monitoring and Sampling Data
Attachment D	TOSCO/Tidewater Groundwater Monitoring and Sampling Data

cc: *Client Confidential*

Proposal to Provide Engineering Services on the Closed Lincoln Landfill Monitoring Project

May 27, 2016



City of Lincoln
Attn.: Ray Leftwich, PE,
City Engineer
600 Sixth Street
Lincoln, CA 95648



48 Bellarmine Court, Suite 40
Chico, CA 95948

May 27, 2016

City of Lincoln Engineering Dept.
Attn.: Ray Leftwich, PE
600 Sixth Street
Lincoln, CA 95648

Re: Proposal to Provide Engineering Services on the Closed Lincoln Landfill Monitoring Project for the City of Lincoln City Engineer Department

Dear Mr. Leftwich:

We respectfully submit our proposal to provide the City of Lincoln's City Engineer Department with engineering services on the above-noted project. Holdrege & Kull has been providing geotechnical and environmental engineering services since its incorporation in 1993. Specifically, H&K has been providing services to the City of Lincoln for numerous projects, including the Closed Lincoln Landfill, since 2013. Our 45-person staff includes engineers, geologists, hydrogeologist, field engineering technicians and inspectors, and laboratory technicians.

Our firm has offices in Nevada City, Chico, Yuba City, Truckee, Fresno, and Murphys. Our two laboratories, located in the Chico and Nevada City offices, are fully approved by several government agencies, including the Division of the State Architect, Caltrans, and the Army Corp of Engineers.

This project will be facilitated from our Chico office. Our Chico address is 48 Bellarmine Court, Suite 40, Chico, CA 95928. Mr. Shane Cummings, PG, CEG, CHG, will be the principal in charge for this contract. Shane is the head of operations in our Chico office, and he can be reached at 530-894-2487 or by email at SDCummings@HandK.net. Ms. Heidi Cummings, PG, QSD/QSP, will be the project manager and primary point of contact for this work. She can be reached at 530-864-6971 (c), 530-894-2487 (o), or by email at HCummings@HandK.net.

The following pages provide the requested information regarding our qualifications to perform this work. More detailed information, including relevant project experience and the resumes of staff members proposed for this contract, can be found in the Appendix.

Please contact us with any questions or comments regarding our proposal. We look forward to hearing from and to continuing to work with the City.

Sincerely,

HOLDREGE & KULL CONSULTING ENGINEERS & GEOLOGISTS



Shane D. Cummings, PG, CEG, CHG
Principal & Chico Operations Manager

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<i>Full Resumes of Key Staff</i>	
<i>Schedule</i>	
<i>Field Sampling Plan</i>	
<i>Example Operation and Maintenance Report</i>	
Cost Proposal	In separate envelope

Consultant Identification and Qualifications

Holdrege & Kull Consulting Engineers and Geologists (H&K) is a multi-discipline consulting firm, incorporated in 1993 in Nevada City, CA. H&K provides geotechnical engineering, environmental engineering, and construction quality assurance services for public and private projects, including landfills, roadways and bridges, schools, essential services facilities, dams and reservoirs, photovoltaics, and communication towers.

Our construction quality assurance services, including materials testing and inspection, are supported by our materials testing laboratories, which are fully approved by DSA, Caltrans, AASHTO, and the Army Corp of Engineers.

H&K's corporate office is located in Nevada City, with branch offices located in Chico, Yuba City, Truckee, Murphys, and Fresno. It is from our Chico office that work for this contract will be facilitated. The office is located at 48 Bellarmine Court, Suite 40, Chico, CA 95928.

Our 45-person staff includes engineers, geologists, hydrogeologists, field engineering technicians and inspectors, and laboratory technicians. Heidi Cummings, PG, QSD/QSP, will serve as the project manager and primary point of contact for this contract. She can be reached at 530-864-6971 (c), 530-894-2487 (o), and by email at HCummings@HandK.net. The principal in charge, who can legally bind H&K to this contract, will be Shane Cummings, PG, CEG, CHG. He can be reached at 530-894-2487 and by email at SDCummings@HandK.net.

H&K provided geotechnical engineering design, construction quality assurance, and environmental monitoring for the Lincoln Landfill from 2013 through 2016. Other H&K landfill projects have included the Eastern Regional Landfill in Placer County, the Neal Road Landfill in Butte County, and the McCourtney Road Landfill in Nevada County.

Geotechnical Consulting & Engineering

- Geotechnical Investigations
- Foundation Engineering
- CIDH Pile Mitigation
- Retaining Wall Design
- Slope Stability Evaluations
- Earth Dam Design
- Shoring Design
- Distressed Structure Evaluations
- Litigation Support

Environmental Consulting & Hydrogeology

- Phase I & II Environmental Site Assessments
- Soil & Groundwater Evaluations
- Leaking Underground Storage Tanks (LUST)
- Abandoned Mine Land (AML) Assessments
- Preliminary Endangerment Assessments (PEA)
- Engineering Evaluation/Cost Analysis (EE/CA)
- CERCLA Remedial Site Investigations
- Groundwater Modeling & Hydrogeology Evaluations
- Storm Water Pollution Prevention Plans (SWPPP)
- Soil & Groundwater Remediation
- Solid and Liquid Waste Treatment Facilities
- Asbestos Dust Mitigation Plans & Monitoring
- Litigation Support

Solid Waste Engineering

- Landfill Design
- Construction Quality Assurance
- Regulatory Compliance
- Water Quality Monitoring & Reporting
- Landfill Gas Monitoring & Reporting

Geology & Hydrogeology

- Geologic Hazards Reports for Schools & Hospitals
- Geologic Mapping
- Alquist-Priolo Fault Zone Studies & Fault Evaluation
- Geophysical Services
- Ground Penetrating Radar

Construction Quality Assurance

- Special Inspection and Materials Testing, including Structural Steel, Reinforced Structural Concrete, Reinforced Structural Masonry, Spray Applied Fireproofing, Engineered Fill, Hot Mix Asphalt, Post Installed Anchors, Cast-in-Place Piles, Soil and Rock Anchors
- Construction Management

Project Understanding and Approach

This section describes the proposed scope of work for semi-annual monitoring and reporting and operation and maintenance (O&M) of the cutoff trench dewatering system for the Closed Lincoln Landfill for a three year service agreement. The work tasks described herein are based on H&K's project understanding, first-hand experience at the Closed Lincoln Landfill, and experience on similar projects in Northern California.

The Closed Lincoln Landfill is an unlined Class III landfill that was historically operated as a burn dump from 1952 to 1976 and was closed in 1991 by the placement of a low-hydraulic conductivity clay cover. Post-closure maintenance activities and groundwater and surface water monitoring have been ongoing since 1989 in general accordance with the Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements (WDRs) and Monitoring and Reporting Program (MRP) Order No. R5-2003-0142. In 2014, the RWQCB issued Cleanup and Abatement Order (CAO) No. R5-2014-0703, requiring a corrective action be implemented to maintain five feet of separation between the bottom of the waste trenches and the groundwater table. In 2015, a perimeter cutoff trench dewatering system was constructed at the site to prevent the groundwater from intersecting the bottom of the waste trenches and to maintain a minimum separation of five feet between the waste and the water table. The compliance elevation for groundwater at the site is 184.6 feet above mean sea level.

The Closed Lincoln Landfill has a groundwater monitoring well network that is comprised of 18 groundwater monitoring wells and two surface water monitoring points in Auburn Ravine. Stormwater is monitored at four locations on the site in perimeter ditches. The perimeter cutoff trench dewatering system is comprised of 2,000 lineal feet of crushed-rock-filled trench extending the length of the site perimeter. The trenches are graded to drain toward four sumps fitted with level-actuated pumps, where the water is pumped to the north side of the site via force main to gravity discharge piping that extends west beneath Virginiatown Road for disposal in the City of Lincoln sanitary sewer.

The following sections include a discussion of health & safety requirements, a scope of work for sampling and analysis of environmental media, facility monitoring and maintenance, water quality reporting, and tasks associated with the cutoff trench dewatering system O&M.

Health and Safety

H&K will prepare a Site Safety Plan (SSP) that identifies the anticipated hazards associated with field work and sample handling and describes the protocols that H&K personnel will implement for mitigating those hazards. The SSP will be prepared in accordance with the guideline set forth in California Hazardous Waste Operations Standard, Section 5192 of Title 8 of the Code of California Regulations (8 CCR 5192); the Hazardous Communications Standard, 8 CCR 5194; and OSHA's Safety and Health Standard of Title 29 of the Code of Federal Regulations (29 CFR 1910.120, 29 CFR 1926). H&K personnel assigned to onsite field operations will be certified under the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910).

Sampling, Inspection, Repair, and Reporting Requirements of the MRP and Corrective Action Work Plan

H&K will be responsible for the monitoring and reporting of groundwater, leachate seeps, and surface water, and for facility monitoring and minor repairs associated with annual maintenance as required by the RFP and as specified in the WDR/MRP Order No. R5-2003-0142. In addition, H&K will be responsible for the long-term O&M of the perimeter cutoff trench dewatering system, including weekly remote monitoring of the telemetry system, sampling, system monitoring, and reporting as specified in CAO No. R5-2014-0703 and the *Corrective Action Work Plan* developed by Holdrege & Kull, dated September 30, 2014. H&K proposes to perform the following tasks to meet RWQCB requirements.

Groundwater Monitoring

The groundwater monitoring well network consists of 18 groundwater monitoring wells. Monitoring wells MW-2, MW-6, MW-8, MW-9, and MW-20 are considered background points. Monitoring wells MW-1, MW-4, MW-5, MW-7, MW-11, MW-12, and MW-15 through MW-19 are down-gradient/cross-gradient of the waste unit. Wells MW-1, MW-4, MW-5, and MW-11 are considered points of compliance (ATC Group Services [ATC], 2016). One additional well (MW-21) and two dual-completion piezometers exist interior to the site and are used along with other site wells for evaluating the effectiveness of the perimeter cutoff trench dewatering system in lowering the groundwater table to the compliance elevation of 184.6 feet mean sea level. Static groundwater levels will be measured in each of the site monitoring wells on a quarterly basis, and groundwater sampling and analysis will be performed on a semiannual basis with the five-year constituents of concern (COC) included in the first half of the 2019 monitoring event. A *Field Sampling Plan* (FSP) is provided in the Appendix of this proposal. The FSP discusses the field procedures and quality control procedures that H&K will employ for the Closed Lincoln Landfill project.

As noted in Section 6.0 of the *Annual Monitoring Report 2015* by ATC dated January 13, 2016, groundwater monitoring well MW-5 should be removed from further monitoring because of its geographical proximity to and similar construction and groundwater quality of MW-1. H&K will further engage with the RWQCB to gain approval of this cost-savings measure to eliminate this and other potential redundancies in the monitoring program.

Leachate Monitoring

Leachate monitoring is required as part of semi-annual standard observations described below under Facility Monitoring. Observed leachate seeps will be sampled and analyzed for the monitoring parameters and COCs listed in the MRP and reported to the City of Lincoln as soon as possible to comply with WDR reporting requirements listed in Section F.5. Although the occurrence of leachate seeps is not anticipated based on site history, H&K assumes, for cost estimating purposes, that one leachate sample per contract year will be analyzed for the monitoring parameters and five-year COCs. Leachate seeps will be sampled in accordance with the FSP provided in the Appendix.

Surface Water Monitoring

Stormwater

According to the MRP stormwater runoff from the site is to be monitored under the State Water Resources Control Board Industrial General Permit (IGP) Order No. 97-03-DW. This order is superseded by new IGP Order No. 2014-0057-DWQ which became effective July 1, 2015. The new order required all facilities subject to the IGP to renew their permits under the new order by submitting an annual fee, and permit registration documents including; a Notice of Intent, site map, and Stormwater Pollution Prevention Plan.

H&K understands, based on conversation with City staff prior to the effective date of the new IGP, that the RWQCB did not require permit renewal for the Closed Lincoln Landfill because the site is closed and subject to the Title 27 post-closure maintenance requirements. The post-closure maintenance requirements include maintenance of monitoring systems and monitoring of groundwater, surface water, and the unsaturated zone in accordance with the requirements of Title 27, Section 20380. Monitoring of the stormwater, therefore, is to be conducted in accordance with a detection, evaluation, or corrective action monitoring program. Because the MRP was written prior to the effective date of the new IGP Order No. 2014-0057-DWQ it does not indicate which monitoring program the stormwater is subject to.

H&K assumes that stormwater will be sampled at the two locations (SW-1 and SW-2) specified in the MRP twice a year and analyzed for the field and monitoring parameters listed in MRP Table E.4. Stormwater samples will be collected in accordance with the procedures described in the FSP (Appendix). H&K will also work with the RWQCB to obtain written clarification of the monitoring requirements for stormwater at the site.

Surface Water

Surface water in Auburn Ravine is to be monitored semiannually at two locations (AR-E and AR-W) for the field and monitoring parameters listed in MRP Table E.4. H&K anticipates that 5-year COC monitoring is not required based on surface water monitoring results and conclusions, presented in the Annual Monitoring Report 2015 (ATC, 2016), that indicate surface water in Auburn Ravine has not been impacted by the release to groundwater. Sampling will be conducted in accordance with the FSP (Appendix).

Facility Monitoring

H&K will conduct standard observations of the facility and receiving waters (Auburn Ravine) on a semi-annual basis in accordance with Section G of the MRP. Repairs identified during the standard observations & ordinary maintenance inspections will be conducted in accordance with the Annual Maintenance task described below and implemented within the required 30 days of each inspection. H&K assumes that the City of Lincoln will be responsible for monthly inspections of the landfill required by MRP Section G.1.

Stormwater Controls & Site Winterization

H&K will inspect precipitation, diversion, and drainage facilities within seven days after major storm events. H&K proposes that a major storm event, for purposes of this proposal, shall be a storm event which produces two or more inches of rain within a 48-hour period. Weather forecasts will be monitored using the National Weather Service Web site (www.srh.noaa.gov/), and a rain gauge will be installed at the site. It is assumed that the City of Lincoln will check the rain gauge following a major storm event. Repair of items identified during the post-storm-event inspections will be provided by H&K as part of Annual Maintenance activities within 30 days of the inspection. The report of damage and subsequent repairs will be submitted to the RWQCB within 45 days of completion of the repairs.

H&K will conduct the annual winterization inspection in anticipation of the rainy season, prior to September 30 of each year. The purpose of the inspection is to identify damage to the landfill cover, grade, precipitation and drainage controls, access roads, etc. Repair of items identified during the winterization inspection will be provided by H&K by October 31 of each year. A winterization report will be submitted by November 15 of each year that includes a discussion of inspection findings and repair measures implemented (if any) and photos of the problems/repairs.

Annual Maintenance

H&K will conduct weed abatement to maintain the fire break and mowing/trimming of vegetation at the site. The mowing will be completed up to five times during the growing season. H&K will provide the requested site repairs on an as-needed basis. Because the nature and extent of repairs and exact number of weed abatement/mowing events were not known at the time of this proposal, H&K assumes that these as-needed repairs and mowing will not exceed the annual dollar amounts listed in the Request for Proposal and listed in the separate sealed cost estimate provided. H&K does not anticipate using subcontractors for this effort.

Operation & Maintenance

H&K will conduct O&M activities weekly and quarterly as requested in the RFP per the requirements of the CAO and *Corrective Action Work Plan*. The remote telemetry will be monitored on a weekly basis to confirm continued operation of the telemetry and ongoing pumping operations. Reports will be generated on a weekly basis from the online user interface and provided to the City. System monitoring, groundwater level measurements, and groundwater sampling will be conducted on a quarterly basis. The O&M activities to be performed and procedures are described in the FSP provided in the Appendix.

Analytical Laboratory Testing

H&K will subcontract with the California-certified analytical testing laboratory, listed in the Individual Staff Experience Section on page 10, to perform the required testing of site environmental samples in accordance with the MRP.

Reporting

H&K will prepare required reports to present the laboratory results, observations, data trend analysis, contaminant plume size evaluation, corrective action monitoring assessment, quality assurance/quality control (QA/QC) assessment, maintenance and repairs for site winterization activities, CAO status reporting, and O&M reports. Draft reports will be provided to the City of Lincoln for review and comment a minimum of five days prior to the RWQCB due date. Final reports and associated analytical data will be uploaded to the SWRCB's Geotracker database or other as required.

Project Deliverables

H&K will prepare documents for the City of Lincoln using Microsoft Word, Excel, and AutoCAD LT Release 2012 or later. The documents will be provided to the City of Lincoln as bound reports, electronic copies, and compact discs. The schedule for project deliverables is provided in the Appendix on pages A-12 – A-16.

Schedule

H&K will begin implementing the environmental monitoring and reporting upon receipt of the notice to proceed from the City of Lincoln. In general, the MRP- and CAO-required monitoring will be conducted during each semester, quarterly for groundwater level measuring and O&M, and monthly for facility monitoring. Data validation, statistical assessment, and the water quality protection standard elements will be addressed and included in the MRP-required semi-annual report. Stormwater monitoring is anticipated to occur whenever there is a discharge of stormwater from the site. H&K has four sampling personnel that stand ready to conduct stormwater monitoring, and we will maintain a sampling kit with task instructions at our facilities for rapid deployment to capture samples. Post-storm-event inspections will occur as-needed within seven days of a major storm event.

Quality Assurance / Quality Control

H&K's quality assurance program is designed to enable the delivery of services to our clients in a consistent high-quality manner that meets or exceeds their expectations. The quality procedures described in H&K's *Quality Control Manual* support consistency in our projects and processes and, therefore, enhance the overall quality of the work products and services that we deliver to our clients while improving our financial performance and limiting our liabilities. These procedures apply to all activities, whether internal or external, and to all H&K personnel associated with project planning, design, development, engineering, laboratory testing, and consulting activities. The H&K *Quality Control Manual* is available for review upon request.

As part of H&K's commitment to delivering quality services and to assure that project quality objectives are met for the City of Lincoln Closed Lincoln Landfill project, H&K has developed a project-specific Field Sampling Plan (FSP) that is included in the Appendix. The FSP presents, in specific terms, the requirements and procedures for conducting field operations, laboratory analysis of environmental samples, and data reduction and verification procedures. The FSP has been prepared to ensure that 1) the data quality objectives specified for this project are met, 2) the field sampling protocols are documented and reviewed in a consistent manner, and 3) the data collected are scientifically valid and defensible.

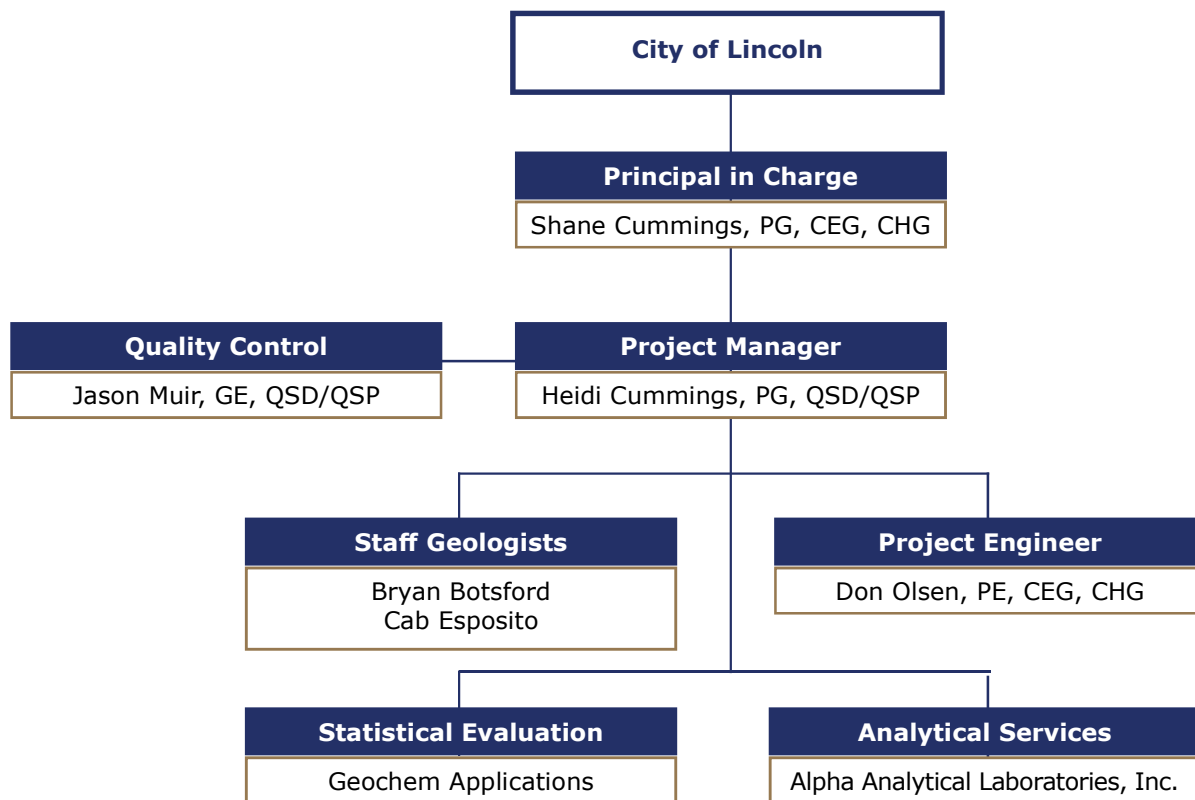
Related Project / Client Information

The chart below provides an overview of H&K's similar project experience. Detailed project descriptions are provided in the Appendix.

PROJECT	REFERENCE	Waste Discharge Requirements	Monitoring and Reporting Program	Cleanup and Abatement Order	Groundwater Monitoring	Surface Water Monitoring	Facility Monitoring	Facility Maintenance	Water Quality Protection Standard	Remediation	Quality Assurance/Quality Control
Closed Lincoln Landfill Placer County, CA Facility Size: 6.3 acres Estimated Cost: \$346,000 Reference Info: See page A-2	Ray Leftwich, PE City Engineer City of Lincoln City Engineer's Dept. 600 Sixth Street Lincoln, CA 95648 916-434-2457 rleftwich@ci.lincoln.ca.us	X	X	X	X	X	X	X	X	X	X
McCourtney Road Landfill Grass Valley, CA Facility Size: 244 acres Estimated Cost: \$2.3 million Reference Info: See page A-1	David Garcia, Jr., PE Transportation Planner Nevada County Dept. of Public Works 950 Maidu Ave. Nevada City, CA 95959 530-265-7038 david.garcia@co.nevada.ca.us	X	X	X	X	X	X	X	X	X	X
Fulton Reclamation Facility Glenn County, CA Facility Size: 273 acres Estimated Cost: \$111,400 Reference Info: A-3	Carol Fulton President Fulton's Reclamation Facility 3507 County Road M Orland, CA 95963 530-865-3680 countrycarol3507@gmail.com	X	X		X	X	X	X	X		X

Holdrege & Kull has provided services on numerous landfill projects, including the Lincoln Landfill. Services at Lincoln Landfill have included drilling and piezometer construction to facilitate development of a conceptual site model and conceptual design of the cutoff trench dewatering system; development of the Corrective Action Work Plan, Technical Specifications, and Design drawings for the cutoff trench dewatering system; performing construction quality assurance for installation of the dewatering system; performing system startup and O&M; and preparation of O&M and CAO status reports. In addition, H&K acted as liaison with the RWQCB throughout the development and issuance of the CAO through construction and was instrumental in obtaining written confirmation from the RWQCB that the City had accomplished substantial compliance with the CAO. Other landfill projects have included the McCourtney Road Landfill in Nevada County, the Fulton Reclamation Facility in Glenn County, the Eastern Regional Landfill in Placer County, and the Neal Road Landfill in Butte County. The chart below gives a snapshot of work performed on related projects. More detailed project descriptions are provided in the Appendix on pages A1 – A3.

Individual Staff Experience and Project Organization



Shane Cummings, PG, CEG, CHG, is a Principal Geologist of Holdrege & Kull and Operations Manager of the Chico office. Mr. Cummings performs and oversees field investigations for geotechnical and materials testing projects, geologic hazards evaluations, environmental investigations, earthquake fault and surface rupture hazards, air photo interpretation, environmental site assessments, and remediation of contaminated sites. Mr. Cummings's environmental experience includes soil, groundwater and vadose zone investigations and remediation of sites contaminated by chlorinated solvents, inorganics, petroleum hydrocarbons,

pesticides, and heavy metals for which he has prepared Corrective Action Plans, Feasibility Studies, and Remedial Action Workplans. He is the past President of the Feather River Branch of the American Society of Civil Engineers (ASCE) and a Subject Matter Expert with the California Board for Professional Engineers, Land Surveyors, and Geologists (BPELSG). He also prepares the examinations for licensure as Certified Hydrogeologist (CHG) and for the California Supplemental Component to the Professional Geologist (PG) exams.

Heidi Cummings, PG, QSD/QSP, is a Senior Geologist with 17 years of experience. She is a member of the Holdrege & Kull environmental team, H&K's Safety Coordinator, and has served as a subject matter expert for the BPELSG. Ms. Cummings has managed a variety of geologic and hydrogeologic evaluation projects that involved historical data review, initial investigation, full site characterization, remedial design and construction, monitoring and remedy evaluation, and site closure for federal, state, county, and private projects. She has evaluated groundwater data using stiff, piper, Schoeller diagrams, and geospatial analysis; developed monitoring and reporting programs; analyzed aquifer test data and extraction system data; generated geologic and hydrostratigraphic cross sections; and designed extraction and monitoring well systems. She is responsible for quality control and technical review of sampling and analysis plans, health and safety plans, monitoring compliance reports, remedial investigation reports, corrective action plans, and feasibility studies.

Jason W. Muir, PE, GE, is a principal of Holdrege & Kull and manager of the Environmental Division of the Nevada City office. He has been in the industry and with the firm for 21 years. Mr. Muir and his team have performed more than 500 Phase I/II environmental site assessments for municipal, commercial, residential, and transportation improvement projects, characterizing and mitigating environmental conditions such as leaky Underground Storage Tanks (USTs), lead-containing paint (LCP), naturally occurring asbestos (NOA), aerially deposited lead (ADL), pesticide releases, and unpermitted disposal sites pursuant to local, state, and federal guidelines.

Don Olsen, PE, PG, CEG, CHG, is a principal of Holdrege & Kull and General Manager of the Chico and Yuba City offices. He has been in the industry for 39 years, the last 18 of which have been with H&K. His experience includes geotechnical engineering, civil engineering, engineering geology, hydrogeology, and construction management. He is a Subject Matter Expert with the California BPELSG and assists with preparation and grading of exam questions. Mr. Olsen's hydrogeology projects have included groundwater resource evaluations; long-term groundwater recharge estimates; groundwater seepage and contaminant transport remediation; well points, large pumping wells, and coffer dam excavation dewatering systems; aquifer characterization using pumping well and slug tests; and field permeability testing by sealed double ring infiltrometer (SDRI) and two stage borehole infiltrometer TSBI methods.

Bryan Botsford joined Holdrege & Kull three years ago after working in the WDR enforcement division at the RWQCB. He is an invaluable asset to the firm, performing numerous and varied projects, including contaminated soil and groundwater investigations and remediation, contaminant transport evaluations, geotechnical investigations, geologic evaluations, abandoned mine lane characterizations, mine permitting, Storm Water Pollution Prevention Plan (SWPPP) preparation and implementation, and landfill post-closure monitoring.

Cab Esposito joined Holdrege & Kull in 2016, bringing four years of environmental consulting experience. He graduated from Northern Arizona University with a degree in geology, participated in oil and gas exploration in Texas and Pennsylvania, and has worked on multiple mine remediation projects including multiple Superfund sites. Mr. Esposito has experience in site characterization, environmental sampling, geotechnical investigations, hydrologic monitoring, field instrumentation, and construction management of well installations and large earthworks projects.

William L. Neal, MS, PG, is a principal with Geochem Applications, a subconsultant firm that H&K has added to its team for provision of statistical evaluations during this contract. Geochem Applications' services will account for approximately 9 percent of the total 3-year contract cost. Mr. Neal has 30 years of experience evaluating water quality data and is recognized for his expertise in statistical analysis and evaluation of water quality data. Mr. Neal serves as a panelist on the Central Valley Regional Water Quality Control Board's Groundwater Monitoring Advisory Workgroup. In this capacity, he provides technical input to Central Valley RWQCB staff on the use of statistical and geochemical methods of analysis for establishing background and evaluating groundwater degradation. On several occasions, he has successfully demonstrated to regulatory agencies that statistically anomalous water quality monitoring results are a result of natural processes rather than man-made contamination. Mr. Neal has extensive expertise in the design and implementation of landfill monitoring programs, with his core expertise being California Title 27 programs and related Water Quality Protection Standard (WQPS) development. He currently performs statistical evaluation of monitoring data from more than 30 landfills on a routine basis. Mr. Neal will be charged with performing statistical analysis of groundwater compliance monitoring data for this project.

Alpha Analytical Laboratories will be the analytical laboratory subconsultant. Analytical services comprise approximately 45 percent of the total three-year-contract cost. Alpha Analytical has been a California accredited laboratory since 1975 and was selected based on H&K's past working relationship, quality work product, and ability to meet project data quality objectives. The analytical services for the Closed Lincoln Landfill project will be conducted in their facility, located in Elk Grove, California. They are certified by the California Environmental Laboratory Accreditation Program (Certificate Nos. 1551, 2728, and 2922).

Workload and Substitutions

Holdrege & Kull is committed to providing staff in a timely manner to meet the needs of the City of Lincoln for this contract. H&K has estimated that the overall percentage of workload required by its staff for this contract is 10% per year. In addition, H&K declares that it will make no substitutions of staff for this work without prior written approval from the City.

Exceptions

Holdrege & Kull proposes the following alternative analytical methods:

- TSS by EPA Method SM 2540D
- Cyanide by EPA Method 9014 or SM 4500

Appendix

Full Project Descriptions. A-1 – A-3

Full Resumes of Key Staff. A-4 – A-11

Schedule A-12 – A-16

Field Sampling Plan

Example Operation and Maintenance Report

McCourtney Road Landfill, Nevada County, CA

McCourtney Road Landfill is founded in an extremely complex geologic and hydrogeologic region of the Sierra Nevada Foothills. Holdrege & Kull has performed a wide variety of tasks at this landfill for the County of Nevada. Since 1996, H&K has provided sampling and monitoring of groundwater wells, surface water, leachate extraction wells, surface impoundments, lysimeters, and leachate pump stations. H&K has prepared quarterly, semi-annual, and annual water quality reports required by the Regional Water Quality Control Board. Most recently, H&K updated the Water Quality Protection Standard (WQPS) and revised the Monitoring and Reporting Program (MRP) to eliminate monitoring points that are no longer needed. H&K is currently customizing monitoring systems, monitoring protocol, and data evaluation protocol; monitoring groundwater



Reference

David Garcia, Program Manager
Nevada County DTS
530-265-7038

surface water, landfill gas, soil pore water, soil vapor, storm water and leachate; performing inter-well and intra-well statistical analysis; managing compliance of a Detection Monitoring Program (DMP) and a Corrective Action Program (CAP); performing iso-contour mapping and settlement calculations; providing financial assurance updates and Post-Closure Maintenance Plan (PCMP) updates; preparing O&M plans; and preparing a Preliminary Closure Plan for surface impoundment decommissioning. H&K also recently negotiated new WDRs with the RWQCB, which resulted in reduced monitoring requirements and the elimination of nine off-site wells from the monitoring requirements.

Project Owner: Nevada County DTS

Project Duration: 1996 - present

H&K Fee: \$300,000 annually

H&K Staff Involved: Bryan Botsford, John Atkinson, Jason Muir, Tom Holdrege

Services Provided:

- ✓ Geotechnical engineering design
- ✓ Environmental monitoring
- ✓ Geologic and hydrogeologic evaluations
- ✓ Preparation of planning documents
- ✓ Construction quality assurance, including materials testing and inspection

Lincoln Landfill, Lincoln, CA

Holdrege & Kull prepared a conceptual site model (CSM) to assess the sources and extent of a contaminant plume emanating from the landfill property. Using the results of the CMS, H&K designed a perimeter cutoff trench dewatering system that will lower the groundwater level to below the bottom of the waste and extract the existing plume to meet the requirements of the California Water Quality Control Board. H&K provided construction quality assurance (CQA) observation and materials testing services during construction and operation and maintenance (O&M) activities including system startup monitoring and reporting. H&K is currently providing ongoing monthly O&M, telemetry monitoring, sampling and analysis, and reporting.



Reference

Ray Leftwich, PE, City Engineer
City of Lincoln
916-434-2470
rleftwich@ci.lincoln.ca.gov

Project Owner: City of Lincoln

Project Duration: 2013 - present

H&K Fee: \$346,000 (Construction cost: \$4M)

H&K Staff Involved: Don Olsen, Heidi Cummings,
Riley Melvin, and Chris Palmer

Services Provided:

- ✓ Geotechnical engineering design
- ✓ Environmental monitoring
- ✓ Remediation design
- ✓ Operation & maintenance
- ✓ Construction quality assurance, including materials testing and inspection

Fulton Reclamation Facility, Glenn County, CA

Holdrege & Kull (H&K) is providing semi-annual hydrogeologic consulting services for the Fulton Reclamation Facility (FRF) in accordance with the California Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements (WDR) and Monitoring and Reporting Program (MRP) Order No. R5 2008-0045. The facility recycles non-hazardous drilling mud as part of a soil amendment operation where the dried drilling mud is mixed into the upper foot of ground surface to improve the soil texture, soil nutrients, and water holding capacity, resulting in an agriculturally beneficial admixture. The drilling mud is classified as a "designated waste" by the RWQCB, due to the relatively high concentration of total dissolved solids. The application area, including the test plots along the eastern property boundary, encompasses approximately 232 acres of the total 315 acre site.



Reference

Carol Fulton, Owner/Operator
Fulton Reclamation Facility
530-877-4971

FRF is required to perform daily, monthly, semi-annual, and annual sampling and reporting of the waste receiving, soil amending, and vadose zone and groundwater monitoring activities. To comply with the WDRs and MRP, a monitoring network comprised of 12 groundwater monitoring wells, 33 soil suction lysimeters, and two gypsum block arrays has been installed around and within land application areas. H&K is responsible for performing semi-annual and annual sampling of the monitoring wells and lysimeters, compiling and evaluating analytical laboratory results, preparing Shoeller diagrams that compare groundwater quality, and preparing semi-annual reports.

Project Owner: Fulton Reclamation Facility

Project Duration: 2005 - present

H&K Fee: \$10,000 annually

H&K Staff Involved: Shane Cummings, Heidi Cummings

Services Provided:

- ✓ Environmental compliance
- ✓ Groundwater monitoring
- ✓ Vadose zone monitoring
- ✓ Hydrogeology consulting



Shane Cummings, PG, CEG, CHG

Operations Manager, Chico Office

Principal in Charge

Shane Cummings, PG, CEG, CHG, is Operations Manager of the Chico office. Mr. Cummings performs and oversees field investigations for geotechnical and materials testing projects, geologic hazards evaluations, environmental investigations, earthquake fault and surface rupture hazards, air photo interpretation, environmental site assessments, and remediation of contaminated sites. Mr. Cummings's environmental experience includes soil, groundwater and vadose zone investigations and remediation of sites contaminated by chlorinated solvents, inorganics, petroleum hydrocarbons, pesticides, and heavy metals for which he has prepared Corrective Action Plans, Feasibility Studies, and Remedial Action Workplans. He is the past President of the Feather River Branch of the American Society of Civil Engineers (ASCE) and a Subject Matter Expert with the California Board for Professional Engineers and Land Surveyors. He also prepares the examinations for licensure as Certified Hydrogeologist (CHG) and for the California Supplemental Component to the Professional Geologist (PG) exams.

Education

- B.S. in Geology, California State University, Chico

Registrations / Certifications

- Professional Geologist, CA No. 7915
- Certified Engineering Geologist, CA No. 2492
- Certified Hydrogeologist, CA No. 885
- Qualified SWPPP Developer/Practitioner, CA No. 736

Expertise

- Contaminated soil and groundwater investigations
- Geotechnical investigations
- Remediation of soil and groundwater
- Contaminant transport evaluations
- Engineering geology
- Geologic evaluations
- Aquifer and hydrogeological evaluations
- Borehole geophysical applications in fractured rock
- Landfill design, closure, and post closure monitoring

Affiliations

- Geoprofessional Business Association
- ASCE, Past President Feather River Branch
- Association of Environmental and Engineering Geologists
- Earthquake Engineering Research Institute
- Seismological Society of America
- National Ground Water Association

Representative Projects

Fulton Reclamation Facility, Orland, CA

Engineering geologist in charge of semi-annual groundwater and Lysimeter monitoring and reporting for the drilling mud disposal soil amendment facility under the guidance of the RWQCB waste discharge requirements and monitoring and reporting program R5-2008-0045. Annual facility inspections are also performed to comply with storm water best management practices.

McClellan AFB PRL S-040 Biovent Site, McClellan Park, CA

Engineering geologist responsible for assessing a former Air Force maintenance and aircraft test area (MAT B). The site was listed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Following the site characterization and delineation of hydrocarbon contamination, an active soils biovent system was designed, constructed, and operated. The soils biovent system included 15 air injection wells and five vapor monitoring wells.

Sheridan Wastewater Treatment Plant, Sheridan, CA

Engineering geologist responsible for the geotechnical investigation and hydrogeologic evaluation. Evaluated soil characteristics and extent of clay soil in the area of the proposed wastewater treatment plant expansion area. Groundwater monitoring wells were installed in order to perform groundwater sampling and evaluate effects from the existing percolation pond on regional water quality.

Stratton's Market, Paradise CA

Engineering geologist in charge of managing this leaking underground storage tank (LUST) site for eight years. Multiple site investigations, involving soil sampling and monitoring well installations on and off site, were necessary to identify the full horizontal and vertical extent of contamination from the historical operation. Soil analytical results from the site investigations showed that fuel contamination was related to the fuel dispensers and not the USTs. Currently the site is being monitored for natural attenuation.

Orland Lift Station and Sewer Extension, Orland, CA

Engineering geologist for the design approach to construction of a lift station in an area where standard excavation methods were not possible. The depth of the proposed lift station was approximately 29 feet below the existing ground surface (bgs), and the 15-inch-diameter sewer pipe was placed at a maximum depth of approximately 21 feet bgs in an area underlain by cohesionless sand and gravel deposits and shallow groundwater at approximately 10 feet bgs. A subsurface investigation was conducted using a hollow stem auger drill rig to collect standard penetrometer test blow counts and undisturbed representative soil samples. An extraction well and four observation wells were constructed, and a 72-hour constant discharge aquifer pump test performed to determine the hydrogeological properties of a gravelly shallow aquifer and develop geotechnical engineering design recommendations for use by the dewatering contractor, shoring contractor, and sewer line trench backfill contractor. A preliminary coffer-dam sheet pile design with tie-back restraints was developed to allow the contractor to limit the trench width during construction. This design included analyses of groundwater flow nets and laboratory shear strength test results.

Capehart Service Station, Beale AFB, Marysville, CA

Engineering geologist performing investigation, data evaluation and reporting regarding MTBE within perched groundwater and the underlying fractured bedrock aquifer. The cleanup of soil and groundwater at this active gas station was performed under the RCRA cleanup program of the Office of Environmental Excellence. Site characterization included multiple phases of investigation involving deep, hard rock continuous coring/exploratory borings and monitoring well installation, borehole geophysical surveys, sampling and pump testing. Mr. Cummings designed, constructed, and operated a groundwater extraction and treatment system and conducted supplemental investigations on the fate and transport of MTBE through fractured rock.



Heidi Cummings, PG, QSD/QSP

Senior Geologist, Chico Office

Corporate Safety Coordinator

Project Manager

Heidi Cummings, PG, is a Senior Geologist with over 16 years of experience. She is a member of the Holdrege & Kull environmental team and is H&K's Safety Coordinator. Ms. Cummings has managed a variety of geologic and hydrogeologic evaluation projects that involved historical data review, initial investigation, full site characterization, remedial design and construction, monitoring and remedy evaluation, and site closure for federal, state, county, and private projects. She has evaluated groundwater data using stiff, piper, Schoeller diagrams, and geospatial analysis; developed monitoring and reporting programs; analyzed aquifer test data and extraction system data; generated geologic and hydrostratigraphic cross sections; and designed extraction and monitoring well systems. She is responsible for quality control and technical review of sampling and analysis plans, health and safety plans, monitoring compliance reports, remedial investigation reports, corrective action plans, and feasibility studies.

Representative Projects

Closed Lincoln Landfill, City of Lincoln, Placer County, CA

Project manager and project geologist responsible for the initial peer review of a Draft Corrective Action Plan prepared by others. Reviewed historical hydrogeological data that revealed data gaps in the site geology and hydrogeology. Reviewed and provided technical comments to the Draft Cleanup and Abatement Order issued by the Regional Water Quality Control Board (RWQCB). Developed a Conceptual Site Model (CSM) and Data Gaps Work Plan that was submitted and approved by the RWQCB. Implemented the approved Work Plan, which included hollow stem auger drilling, borehole logging, and piezometer design. Coordinated and oversaw drilling, laboratory, and surveying subcontractors. Performed materials testing on select samples collected from the site to determine grain size distribution. Developed the Field Summary Report and updated CSM based on information obtained from the data gaps investigation and provided preliminary design and corrective action recommendation for a perimeter dewatering trench system that would achieve 5-foot separation between the deepest portion of the waste and the water table. The trench spacing and depths were designed based on applications of the Dupuit Theory of unconfined flow to cutoff trenches, a closed

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Education

- B.S. in Geology, California State University, Chico

Registrations / Certifications

- Professional Geologist, CA No. 7732
- Qualified SWPPP Developer/Practitioner, CA No. 00180

Specialized Training

- 40-hour HAZWOPER
- CPR/First Aid Certified
- Qualified SWPPP Developer & Practitioner
- High Performance Leadership Training
- Certified Project Manager
- Improving Hydrogeologic Analysis of Fractured Bedrock Systems
- Groundwater Modeling with GMS
- RockWorks Training Class

Expertise

- Geologic and Hydrogeologic Studies
- Site Characterization, Assessment, and Remediation
- Contaminant Transport Evaluations
- Borehole Geophysical Applications in Fractured Rock
- Compliance Monitoring and Reporting
- Phase I/II ESA
- Storm Water Compliance

Affiliations

- Association of Engineering & Environmental Geologists (AEG)
- California State University, Chico, Professional Advisory Board, Geological & Environmental Sciences

form analytical model. Developed the Corrective Action Work Plan and co-authored the technical specifications for construction. Ms. Cummings was the project manager and project geologist for construction of the cutoff trench dewatering system. She developed system operating criteria, performed system startup and ongoing, operations, maintenance, sampling, and reporting.

Neal Road Recycling and Waste Facility, Butte County, CA

Project geologist responsible for the coordination of staff and subcontractors in the implementation of quarterly, monthly, and on-call field sampling events for landfill gas, groundwater, surface water, soil pore water, leachate, and septage pond supernatant, as well as the preparation of periodic compliance reports for media sample results. Responsible for environmental monitoring and the design and installation of four groundwater monitoring wells at the site. Supervised the installation of seven soil gas monitoring probes under the responsible charge of a professional engineer. Evaluated geochemical data using Stiff and Piper diagrams. Coordinated the analytical laboratory for electronic data deliverables and uploaded the quarterly monitoring data and reports to GeoTracker, the State Water Resource Control Board database.

Landfills 2 & 3 at Beale AFB, Marysville, CA

Project manager in charge of sampling, technical writing, and data analysis/interpretation for two landfills in post closure monitoring. Groundwater, surface water sampling, and landfill gas monitoring were performed in compliance with RWQCB Waste Discharge Requirements Order No. 96-015.

Johnson Road Illegal Dump Site Remediation Oversight, Del Norte County, CA

Project Manager for waste removal oversight and sampling and analysis for an illegal dump site on Yurok Tribal and privately owned lands in remote northern California. Prepared scope of work, coordinated staff and subcontractors, documented waste removal, and provided CalRecycle with subcontractor options for high-angle training. Staff was trained for work on high-angle slopes and then made available to CalRecycle around the clock and on weekends to document waste removal over a six-week period.

Tulley Creek Illegal Dump Site Remediation Oversight, Humboldt County, CA

Project manager responsible for conducting sampling and providing waste characterization for soil and ash to be disposed. Coordinated with multiple laboratories to perform analyses over a weekend to meet the very tight schedule and needs of CalRecycle.

Former McClellan AFB Groundwater Monitoring Well and SVE Well Network Optimization, Sacramento, CA

Supervising rig geologist responsible for supervising the drilling and installation of groundwater monitoring wells and soil vapor extractions wells. Documented the lithology in accordance with the Unified Soil Classification System, determined depth to groundwater, developed well construction specifications, and monitored site health and safety in the work areas. Served as primary author and team coordinator of the Field Summary Report (FSR), which included site maps for each well location, lithologic logs, well construction diagrams, and waste manifests that documented proper disposal of investigation-derived waste.



Don Olsen, PE, CEG, CHG

*General Manager, Yuba City and Chico Offices
Principal in Charge and Project Manager*

Don Olsen, PE, CEG, CHG, is a principal of Holdrege & Kull and General Manager of the Chico and Yuba City offices. He has been in the industry for 38 years, the last 17 of which have been with H&K. His experience includes geotechnical engineering, civil engineering, engineering geology, hydrogeology, and construction management. He is a Subject Matter Expert with the California Board for Professional Engineers, Geologists and Land Surveyors and assists with preparation and grading of exam questions.

Mr. Olsen's hydrogeology projects have included groundwater resource evaluations; long-term groundwater recharge estimates; groundwater seepage and contaminant transport remediation; well points, large pumping wells, and coffer dam excavation dewatering systems; aquifer characterization using pumping well and slug tests; and field permeability testing by sealed double ring infiltrometer (SDRI) and two stage borehole infiltrometer TSBI methods.

Representative Projects

City of Lincoln Closed Landfill, Lincoln, CA

Project manager responsible for the conceptual site model (CSM) to assess the sources and extent of a contaminant plume emanating from the landfill property. Using the results of the CMS, designed a perimeter trench dewatering system that will lower the groundwater level to below the bottom of the waste and extract the existing plume to meet the requirements of the California Water Quality Control Board. Mr. Olsen was the engineer of record for construction of the cutoff trench dewatering system. During construction, he designed an alternative trenching system which allowed the contractor to avoid shoring of the trenches due to side-wall caving. The alternative trenching design resulted in substantial cost savings to the overall construction project.

Neal Road Landfill, Butte County, CA

Project manager for construction quality assurance engineering services for final closure of waste management units 1, 2, and 3 and for construction of liquid waste management ponds.

Education

- M.S. in Geology, Civil Engineering (geotechnical emphasis), San Jose State University
- B.S. in Engineering Geology, San Diego State University

Registrations/Certifications

- Professional Engineer, CA No. 49514
- Certified Engineering Geologist, CA No. 1853
- Professional Geologist, CA No. 5329
- Certified Hydrogeologist, CA No. 271

Expertise

- Civil and Geotechnical Engineering Design
- Construction Project Management
- Landfill Final Cover and Base Liner Systems
- Groundwater Resource Evaluation
- Contaminant Transport Modeling
- Elastic and Consolidation Settlement Analysis
- Pier and Pile Foundations
- Cell Tower Foundations
- Retaining Walls

Affiliations

- ASFE The Best People on Earth
- American Society of Civil Engineers
- Association of Engineering Geologists



Jason Muir, PE, GE

*Manager, Nevada City Environmental Division
Principal in Charge and Project Manager*

Jason Muir, PE, GE, manages H&K's Nevada City Environmental Division and is an H&K Principal. His professional background includes site characterization, risk assessment and remediation under CERCLA, mine permitting and reclamation under SMARA, and water quality evaluation and permitting under the California Water Code and Title 27. He and his team have performed over 500 Phase I and Phase II environmental assessments related to environmental conditions including hydrocarbon and solvent release, pesticide residuals, unpermitted waste disposal sites and abandoned mine land.

Mr. Muir has provided site characterization, risk assessment, remedial design and/or remedial quality assurance for over three dozen sites regulated by the California EPA Department of Toxic Substances Control (DTSC). He and his team have characterized abandoned mine lands totaling over 3,000 acres in northern California, and they have participated in eight USEPA Brownfield assessment and cleanup projects. Mr. Muir also performs transportation corridor studies to facilitate environmental review, as well as Phase I/II investigations for ADL and NOA pursuant to Caltrans and California EPA guidelines.

Representative Projects

Yuba River Charter School, Grass Valley, CA

Project manager for a hazardous materials site investigation and preparation of a Removal Action Work Plan (RAW) approved by DTSC for a new elementary school campus. The cleanup plan characterized an existing burn dump and specified procedures for remediation of lead-impacted soil to allow the school construction project to move forward. Based on the cleanup plan, the school was awarded a USEPA Brownfield cleanup grant of \$600,000 to remediate the burn dump, which was completed and approved by DTSC in the fall of 2015 under H&K's supervision.

Deer Creek/Stocking Flat EE/CA, Nevada City, CA

Project manager for site investigation related to an Engineering Evaluation/Cost Analysis (EE/CA) and Human and Ecological Risk Assessment (HERA) performed on behalf of the United States Bureau of Land Management (BLM). The assessment included characterization of hard rock and placer mine waste deposits and assessment of downstream mercury and methylmercury impact. Work was performed in conjunction with USGS and URS Group.

Education

- M.S. in Environmental Engineering, U.C. Berkeley
- B.A. in Environmental Science, U.C. Berkeley

Registrations/Certifications

- Professional Engineer, CA No. 60167
- Geotechnical Engineer, CA No. 2697

Expertise

- Phase I/II Site Assessment
- Preliminary Endangerment Assessment
- Soil, Soil Vapor, and Groundwater Remediation
- Human Health and Ecological Risk Assessment
- Contaminant Transport Modeling
- Geotechnical Investigation and Design

Affiliations

- Geoprofessional Business Association
- American Society of Civil Engineers
- Association of Drilled Shaft Contractors
- Engineer's Association of Nevada County
- Placer Architects, Geologists, Engineers, and Surveyors
- California Abandoned Mine Land Forum



Education

- B.S. in Geology, CSU Sacramento

Specialized Training

- 40-Hour Hazardous Waste Operations
- 8-Hour Annual HAZWOPER

Expertise

- Site investigations
- Groundwater monitoring

Bryan Botsford

Staff Geologist

Bryan Botsford joined Holdrege & Kull three years ago after working in the Waste Discharge Requirement enforcement division of the RWQCB. He is an invaluable asset to the firm, performing numerous and varied projects, including contaminated soil and groundwater investigations and remediation, contaminant transport evaluations, geotechnical investigations, geologic evaluations, abandoned mine lane characterizations, mine permitting, Storm Water Pollution Prevention Plan (SWPPP) preparation and implementation, and landfill post-closure monitoring.

Representative Projects

McCourtney Road Landfill, Grass Valley, CA

Primary liaison with the Nevada County Public Works department for H&K's general engineering contract for this landfill project. Performed and oversaw groundwater, surface water, leachate, and landfill gas monitoring, and worked with the Central Valley Water Board during the WDR revision for the facility. Also developed an updated Post Closure Maintenance Plan and a Storm Water Pollution Prevention Plan for the facility, and developed a work plan for the installation of additional wells along the groundwater point of compliance at the facility.

Former Sierra Farms #2, Georgetown, CA

Staff geologist in charge of implementing a site investigation work plan that included development of a drilling and sampling strategy to characterize petroleum hydrocarbon contamination in a fractured bedrock aquifer. Characterization techniques included weathered rock core sampling, groundwater monitoring well design and installation, and groundwater sampling.

Upper Dry Creek Slate Mine, Amador County, CA

Staff geologist responsible for developing and implementing a sampling and analysis plan to characterize mined slate deposits and overburden in accordance with Title 27 permitting requirements. Work was performed under Central Valley Water Board oversight. The results were summarized in a Waste Characterization report which compared total and soluble metals to common regulatory benchmarks, and described the acid generation potential of the material to be discarded as waste rock at the site. This report also described the potential for the mining operation to degrade water quality downstream of the site.



Education

- B.S. in Geology/Geochemistry,
Northern Arizona University

Expertise

- Site investigations
- Groundwater monitoring

Cab Esposito

Staff Geologist

Cab Esposito joined Holdrege & Kull in 2016 where he is bringing four years of environmental consulting experience. He graduated from Northern Arizona University with a degree in geology, participated in oil and gas exploration in Texas and Pennsylvania, and has worked on multiple mine remediation projects including multiple Superfund sites. Cab has experience in site characterization, environmental sampling, geotechnical investigations, hydrologic monitoring, field instrumentation, and construction management of well installations and large earthworks projects.

Representative Projects

Platoro Mine, Platoro, CO

Staff geologist for a standard field parameter analysis on water samples to evaluate the efficiency of the current water treatment plant. Also managed the hydrologic database for the project, including complex surface water/groundwater interactions.

Fort Knox Gold Mine, Fairbanks, AK

Staff geologist in charge of a field investigation program to support a hydrogeological evaluation at the Fort Knox Gold Mine. Supervised drilling activities, performed geologic rock logging, and supervised aquifer pump tests for characterization.

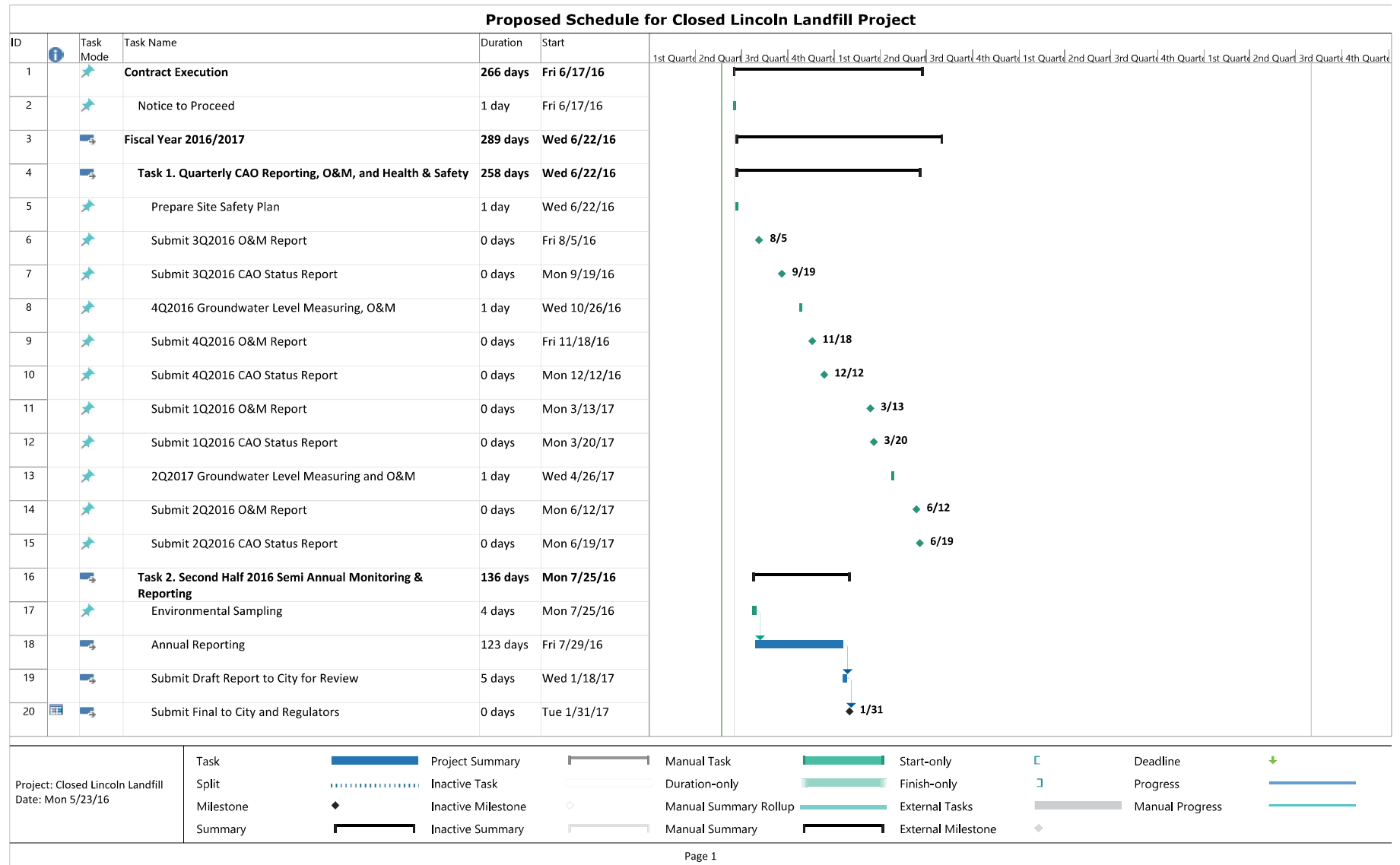
White Mesa Seismic Hazard Analysis, Blanding, UT

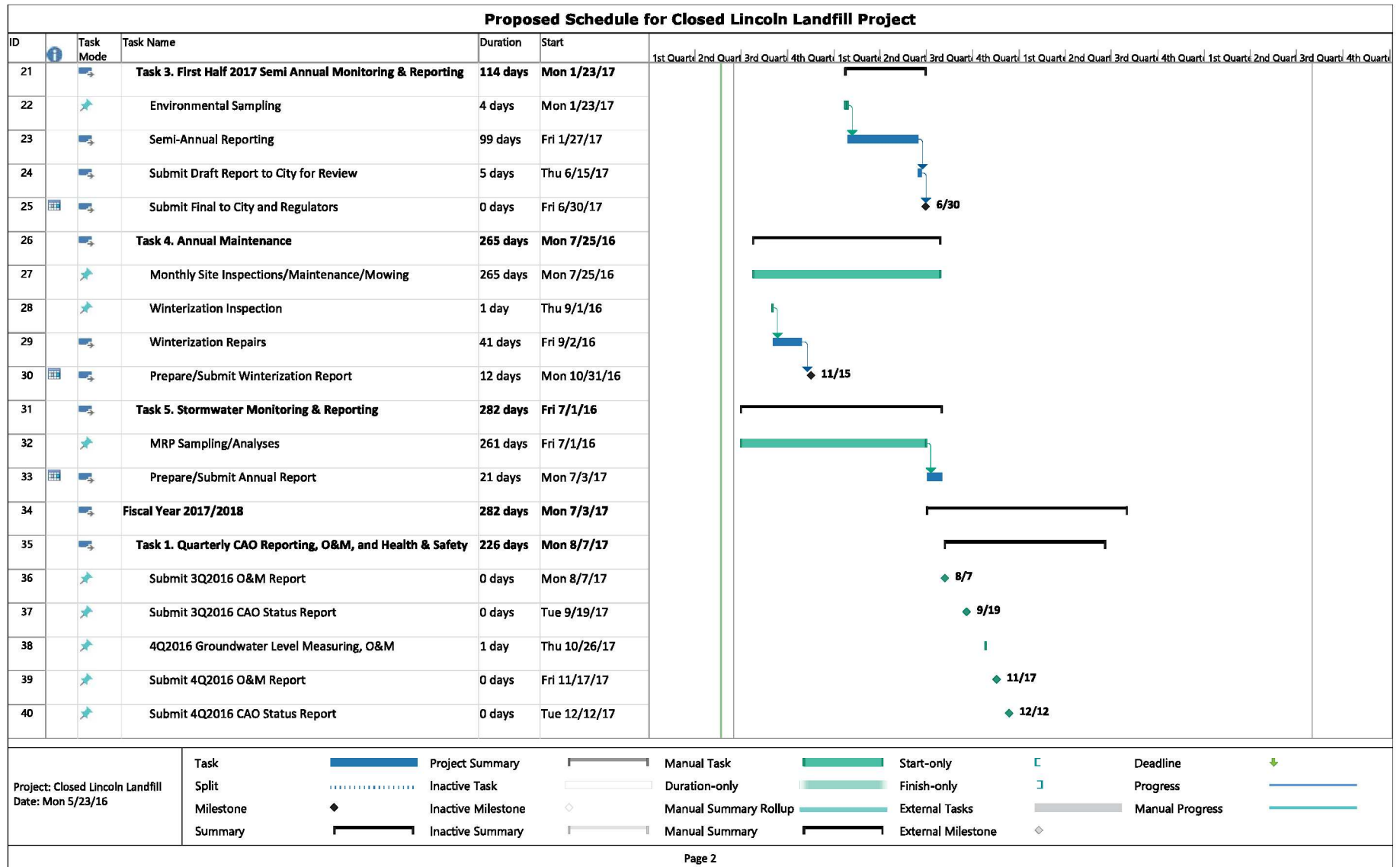
Staff geologist assisting in the performance of a Probabilistic Seismic Hazard Analysis for a critical facility by developing a seismic database, analyzing earthquake and fault data, performing extensive literature review, and providing technical writing support.

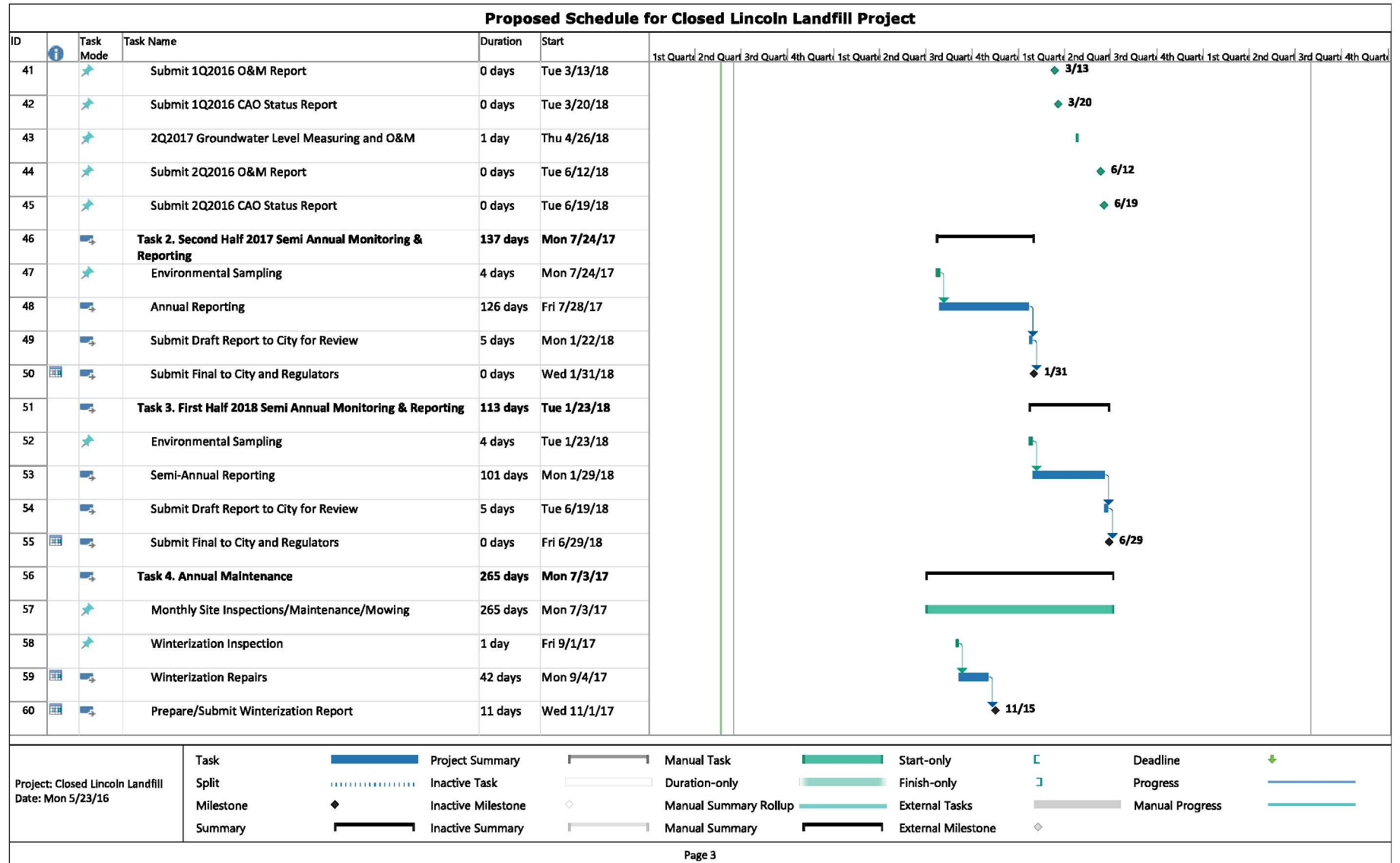
TEC Injection Well, Tampa, FL

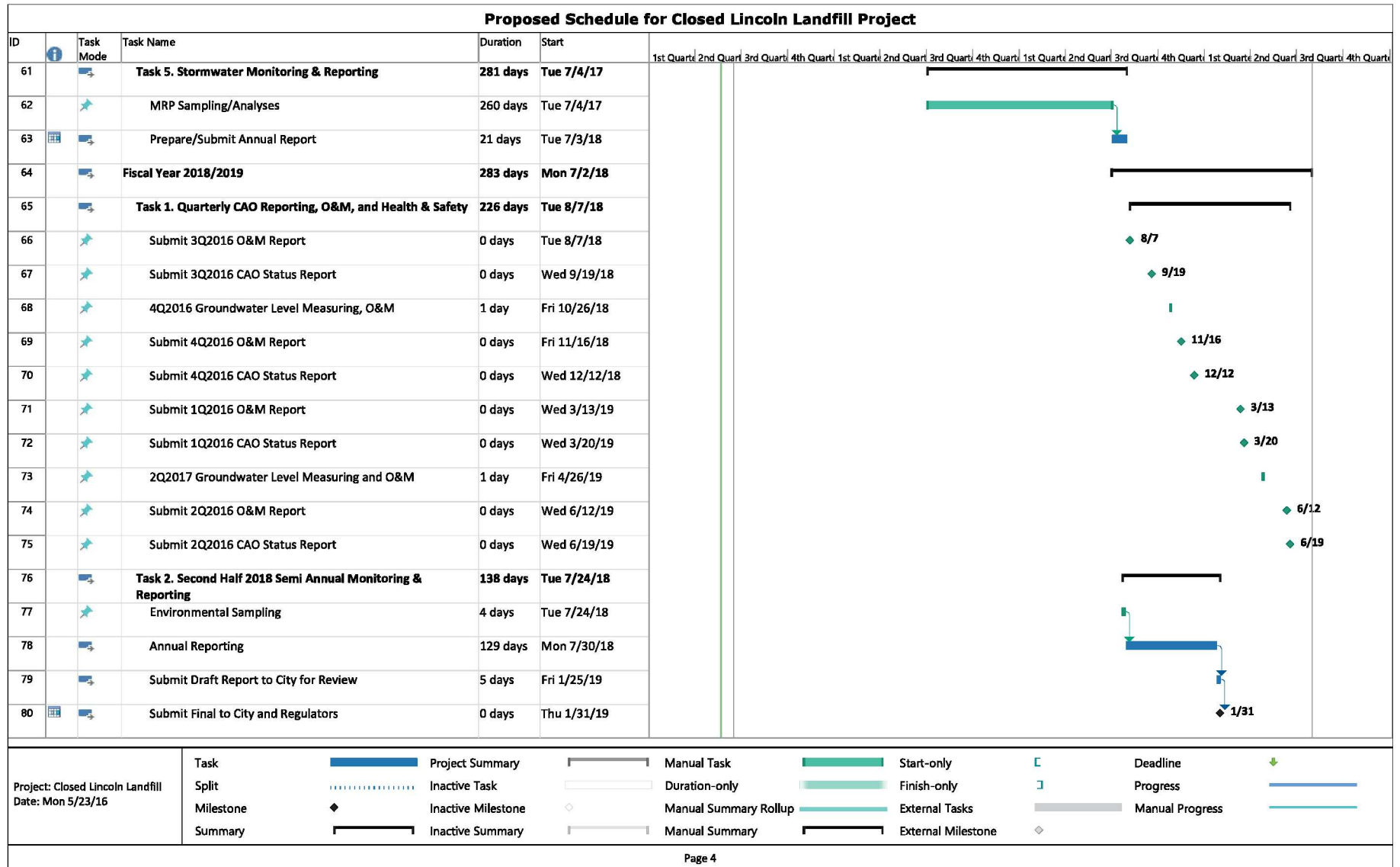
Supervisor in charge of drilling activities during installation of a deep injection well. Responsibilities included logging of drill cuttings, reviewing geophysical logs, managing and analyzing aquifer tests, and supervising drilling and casing installation.

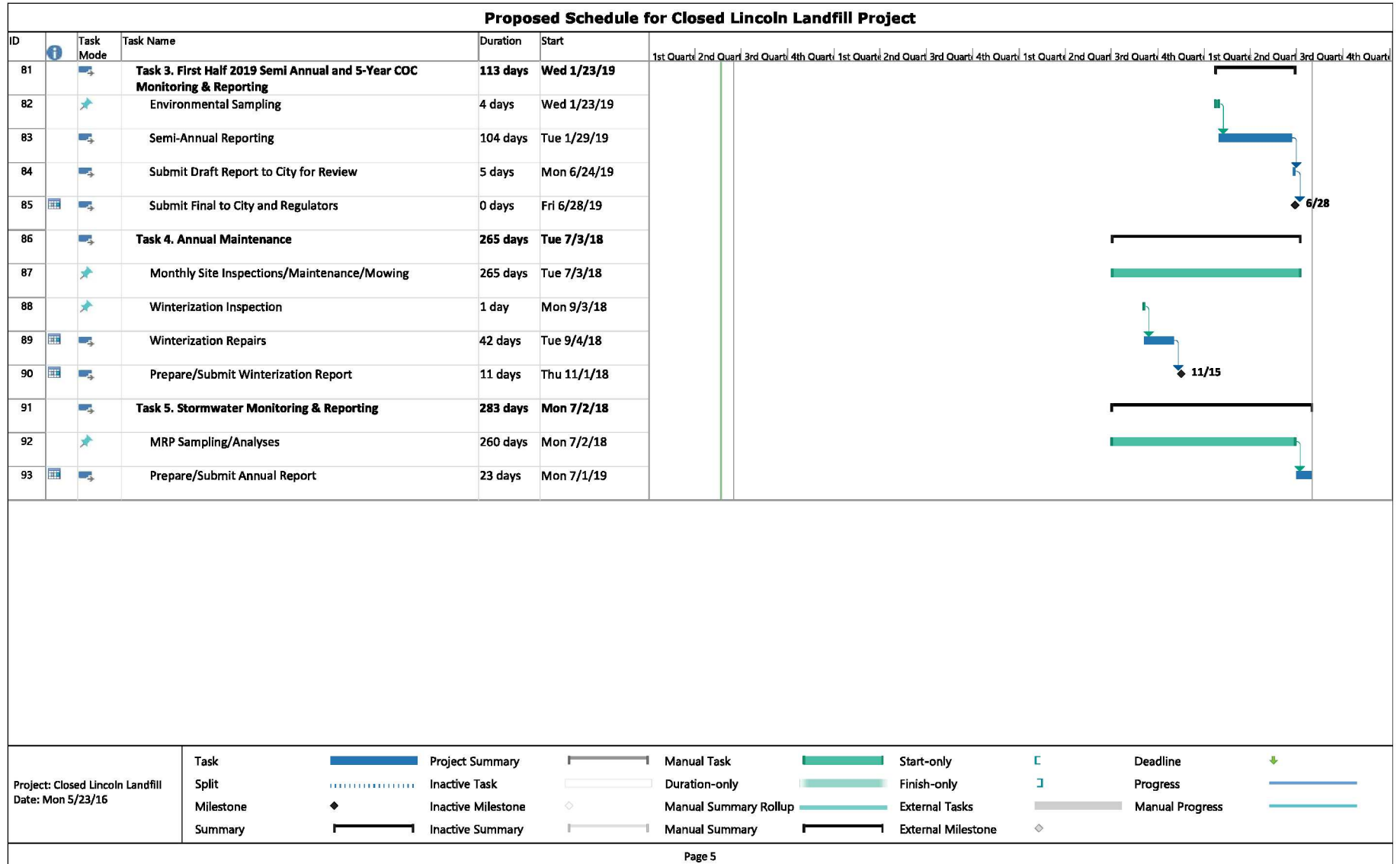
Schedule











Field Sampling Plan

FIELD SAMPLING PLAN
CLOSED LINCOLN LANDFILL

Prepared for:

City of Lincoln
600 Sixth Street
Lincoln, California 95648

Prepared by:

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48 Bellarmine Court, Suite 40
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May 2016

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APPENDIX A: FSP Forms

1.0 INTRODUCTION

This Field Sampling Plan (FSP) presents, in specific terms, the requirements and procedures for conducting field operations, laboratory analysis of environmental samples, and data reduction and verification procedures. This project-specific FSP has been prepared to ensure (1) the data quality objectives specified for this project are met, (2) the field sampling protocols are documented and reviewed in a consistent manner, and (3) the data collected are scientifically valid and defensible.

Guidelines followed in the preparation of this plan are set out in the: *Data Quality Objectives Process for Superfund, Interim Final Guidance* (United States Environmental Protection Agency [U.S. EPA], 1993).

This FSP is required reading for all staff participating in the work effort. The FSP shall be in the possession of the field teams collecting the samples. All subcontractors shall be required to comply with the procedures documented in this FSP in order to maintain comparability and representativeness of the collected and generated data.

1.2 Purpose and Scope

The purpose of this FSP is to present procedures for conducting field-related activities, such as soil sample collection, soil boring drilling, well installation, well development, sampling and analysis, and the preparation of associated documentation. This FSP will be used as general guidance on all H&K environmental field projects (specific details related to sampling, analysis, and health and safety requirements will be provided in project- or site-specific work plans).

2.0 SCOPE AND OBJECTIVES

2.1 Data Quality Objectives

The data quality objectives (DQO) define the quality, quantity, and type of data needed to make decisions. The DQOs established for this program are presented in Table 3-1.

Table 2-1. Data Quality Objectives for Closed Lincoln Landfill

Problems to be resolved:

- Is landfill waste impacting environmental media (groundwater and surface water) on and off site?
- Is the landfill groundwater meeting the water quality protection standard?
- Is the perimeter dewatering cutoff trench remedy achieving groundwater level compliance?
- Is there redundancy in the groundwater monitoring well network?

Decisions to be made:

- Is the groundwater TDS plume increasing or decreasing in size?
- Is the TDS plume impacting surface water in the Auburn Ravine?
- Is groundwater being maintained at a level less than or equal to 186.4 feet mean sea level?
- Can monitoring wells be removed from the monitoring well network?

Inputs to the decision:

- Field data (geologic, hydrogeologic, hydrologic, visual observations, well construction details, etc.).
- Analyze samples (groundwater and surface water) for monitoring parameters and 5-year contaminants of concern.

Boundaries of the program:

- All media (soil, sediment, surface water, and groundwater) within the specific site boundary.

Decision rules:

- Analytical decision rules are defined in Waste Discharge Requirements Order No. R5-2003-0142
- Groundwater levels in wells within the perimeter dewatering cutoff trench must consistently achieve the compliance elevation.

Sources of uncertainty:

- The variability of field and analytical procedures.
- The possibility of unknown contaminants of concern and potential future data gaps.
- Effectiveness of the remedy in place to limit off site migration of the TDS plume
- Effectiveness of the remedy in place to lower groundwater levels to the compliance elevation.

Optimize design for obtaining data:

- Collect samples and analyze in accordance with the WDR Order No. R5-2003-0142 and the Corrective Action Work Plan (H&K, 2014).

2.2 Sample Analysis Summary

The sample analysis details are provided in MRP Sections D, E, and F and include the analytical methods to be performed for each environmental media (leachate, groundwater, and surface water). A summary of environmental media, analytical parameters, and sample quantities is provided in Table 3-2.

2.3 Field Activities

The field activities, including the type, number, and location of samples is to be documented on field data sheets or a field notebook. Example field data sheets are included in Appendix A.

Table 2-2. Sample Analysis Summary

Sampling Media, Analytes and Analytical Methods	Second Half 2016	First Half 2017	Second Half 2017	First Half 2018	Second Half 2018	First Half 2019
GROUNDWATER						
<i>Monitoring Parameters</i>						
Total Dissolved Solids (SM 2540C)	17	17	17	17	17	17
Total Alkalinity (SM 2310B)	17	17	17	17	17	17
Bicarbonate (SM 2310B)						
Chloride (EPA 300)	17	17	17	17	17	17
Nitrate-Nitrogen (EPA 300)	17	17	17	17	17	17
Sulfate (EPA 300)	17	17	17	17	17	17
Total metals Calcium, Magnesium, Potassium, Sodium (EPA 200.7)	17	17	17	17	17	17
Volatile Organic Compounds (EPA 8260B)	17	17	17	17	17	
Duplicate VOCS (EPA 8260B)	2	2	2	2	2	
Trip Blank VOCs (EPA 8260B)	2	2	2	2	2	
Field Blank VOCs (EPA 8260B)	2	2	2	2	2	
<i>5-Year Constituents of Concern</i>						
Inorganics (dissolved) (200.7/245.1)						17
Cr VI (SM 7199/1636)						17
Sulfide (SM 4500 SF)						17
Cyanide (SM 4500 CNE)						17
Volatile Organic Compounds (EPA 8260B, Extended List)						17
Duplicate VOCS (EPA 8260B, Extended List)						2
Trip Blank VOCs (EPA 8260B, Extended List)						2
Field Blank VOCs (EPA 8260B, Extended List)						2
Semi-Volatile Organic Compounds (EPA 8270)						17
Organophosphorus Pesticides (EPA 8041A)						17
Chlorinated Herbicides (EPA 8151)						17
Organochlorine Pesticides (EPA 8081A)						17
Polychlorinated Biphenyls (EPA 8082)	--		--	--	--	17
STORM/SURFACE WATER						
<i>Monitoring Parameters MRP Table E.4</i>						

Table 2-2. Sample Analysis Summary

Sampling Media, Analytes and Analytical Methods	Second Half 2016	First Half 2017	Second Half 2017	First Half 2018	Second Half 2018	First Half 2019
Parameters						
Total Suspended Solids (SM 2540D)	2	2	2	2	2	2
Total Dissolved Solids (SM 2540C)	4	4	4	4	4	4
Total Alkalinity (SM 2310B)	4	4	4	4	4	4
Carbonate (SM 2310B)	4	4	4	4	4	4
Bicarbonate (SM 2310B)	4	4	4	4	4	4
Chloride (EPA 300)	4	4	4	4	4	4
Nitrate-Nitrogen (EPA 300)	4	4	4	4	4	4
Sulfate (EPA 300)	4	4	4	4	4	4
Total metals Calcium, Magnesium, Potassium, Sodium (EPA 200.7)	4	4	4	4	4	4
Volatile Organic Compounds (EPA 8260B)	4	4	4	4	4	4
Trip Blank VOCs (EPA 8260B)	2	2	2	2	2	2
LEACHATE SEEPS						
Total Dissolved Solids (SM 2540C)						
Total Alkalinity (SM 2310B)						
Bicarbonate (SM 2310B)						
Chloride (EPA 300)						
Nitrate-Nitrogen (EPA 300)						
Sulfate (EPA 300)						
Total metals Calcium, Magnesium, Potassium, Sodium (EPA 200.7)						
Inorganics (dissolved) (200.7/245.1))						
Cr VI (SM 7199/1636)						
Sulfide (SM 4500 SF)						
Cyanide (SM 4500 CNE)						
Volatile Organic Compounds (EPA 8260B, Extended List)						
Duplicate VOCS (EPA 8260B, Extended List)						
Trip Blank VOCs (EPA 8260B, Extended List)						
Field Blank VOCs (EPA 8260B, Extended List)						
Semi-Volatile Organic Compounds (EPA 8270)						
Organophosphorus Pesticides (EPA 8041A)						
Chlorinated Herbicides (EPA 8151)						
Organochlorine Pesticides (EPA 8081A)						
Polychlorinated Biphenyls (EPA 8082)						
CUTOFF TRENCH DEWATERING SYSTEM						
Total Dissolved Solids (SM 2540D)	4	4	4	4	4	4

3.0 FIELD OPERATIONS

3.1 Property Damage Control

Caution will be exercised during all field sampling efforts to prevent damage to site features or property. However, if an accident or mishap occurs, the following actions will be taken:

- The sampler(s) will call the project manager immediately (unless the accident requires emergency attention);
- The sampler(s) will describe in detail the incident that has occurred;
- The sampler(s) will document the incident in detail in the daily field log (other documentation such as an accident report will also be completed); and
- The project manager will immediately contact the client project manager to inform him or her of the incident and to discuss appropriate actions to be taken (i.e., how the property will be repaired or replaced, schedule for repair/replacement, etc.).

3.2 Equipment Decontamination

All equipment that may directly or indirectly contact samples shall be decontaminated in a designated decontamination area. This includes sampling devices and instruments, such as pumps and sounders. In addition, the H&K shall take care to prevent the sample from coming into contact with potentially contaminating substances, such as tape, oil, engine exhaust, corroded surfaces, and dirt. Pumps and sounders require decontamination prior to each new site.

For sampling and smaller hand held devices, scrub the equipment with a solution of potable water and Alconox, or equivalent laboratory-grade detergent. Then rinse the equipment with copious quantities of potable water followed by ASTM Type II Reagent Water. High-pressure liquid chromatograph-grade water and distilled water purchased in stores are not acceptable substitutes for ASTM Type II Reagent-Grade Water. Air dry the equipment on a clean surface or rack, such as Teflon®, stainless steel, or oil-free aluminum elevated at least 2 feet above ground. If the sampling device shall not be used immediately after being decontaminated, it shall be wrapped in oil-free aluminum foil, or placed it in a closed stainless steel, glass, or Teflon® container.

Reagent-Grade II Water, shall be purchased, stored, and dispensed only in glass, stainless steel, or Teflon® containers. These containers shall have Teflon® caps or cap liners. It is the H&K's responsibility to assure these materials remain free of contaminants. If any question of purity exists, new materials shall be used.

3.3 Waste Handling

Wastewater generated during groundwater sampling as purge water and as decontamination rinsate will be temporarily stored in a portable water storage tank mounted on a trailer. The wastewater will be transported and disposed to the City of Lincoln sanitary sewer at a location designated by the City.

Used personal protective equipment (PPE) will be considered to be nonhazardous waste and will be disposed at an appropriately permitted facility.

4.0 FIELD SAMPLING ACTIVITIES

This section provides procedures related to field sampling, including sample collection and handling, field sampling equipment use and calibration, and decontamination procedures.

The construction material (e.g., plastic, PVC, metal) of the sampling devices discussed below shall be appropriate for the contaminant of concern and shall not interfere with the chemical analyses being performed.

All purging and sampling equipment shall be decontaminated according to the specifications in Section 3 prior to any sampling activities and shall be protected from contamination until ready for use.

4.1 Groundwater Monitoring Well Sampling

When numerous monitor wells are to be sampled in succession, those wells expected to have low levels of contamination or no contamination shall be sampled prior to those wells expected to have higher levels of contamination. This practice will help reduce the potential for cross-contamination between wells. All sampling activities shall be recorded in the field logbook.

Before groundwater sampling begins, wells shall be inspected for signs of tampering or other damage. If tampering is suspected (i.e., casing is damaged, lock or cap is missing), this shall be recorded in the field logbook and on the well sampling form, and reported to the project manager. Wells that are suspected to have been tampered with shall not be sampled until the project manager has discussed the matter with the project owner.

Before the start of sampling activities, plastic sheeting shall be placed on the ground surrounding the well. The plastic sheeting shall be used to provide a clean working area around the wellhead, and prevent any soil contaminants from contacting sampling equipment. Remove water in the protective casing or in the vaults around the well casing prior to venting and purging.

Purge pump intakes shall be equipped with a positive foot check valve to prevent purged water from flowing back into the well. Purging and sampling shall be performed in a manner that minimizes aeration in the well bore and the agitation of sediments in the well and formation. Equipment shall not be allowed to free-fall into a well.

In addition to the information required in Section 6.0, the following information shall be recorded each time a well is purged and sampled: (1) depth to water before and after purging, (2) well bore volume calculation, (3) sounded total depth of the monitor well, (4) the condition of each well, including visual (mirror) survey, (5) the apparent thickness of any nonaqueous layer and, (6) field parameters such as pH, temperature, specific conductance, DO (as appropriate), and turbidity (visual).

4.1.2 Water Level Measurement

Prior to initiating groundwater sampling, a water level survey will be conducted to measure groundwater flow directions and horizontal gradients across the site. Appendix

A contains an example water sample data sheet. All measurements will be taken from the north side of the casing or as indicated (notched mark). Water levels in all wells and piezometers will be measured to the nearest 0.01 foot using an electronic water level sounder. All water levels within a site will be measured within 72 hours to provide an accurate view of groundwater flow direction. These measurements will be used to produce potentiometric surface maps for each horizon. The sounder will be decontaminated as discussed in Section 3.

4.1.3 Purging Prior to Sampling

Newly installed wells will be sampled no sooner than two days after well development. After that, wells will be sampled in the order of least expected contamination to highest expected contamination, whenever possible, to minimize the potential for cross-contamination. Prior to beginning sampling activities, the waterproof, expanding well cap on the well casing will be removed. The water level and the depth of the well will be measured, and the values obtained will be used to calculate the required purge volume.

A minimum of three submerged well casing volumes will be removed during purging of the monitoring well using a submersible pump. Water quality measurements, including pH, SC, temperature, and turbidity (visual) will be performed periodically on samples of the discharge water. These measurements are collected at a minimum of five times (unless well purges dry) over an evenly spaced time interval of the required purge.

Once the well is sufficiently purged and the measured parameters have stabilized, the well will be considered ready for sampling. Field parameters will be considered stabilized when less than 5% change in SC; less than 0.1 unit change in pH; and $\pm 1^{\circ}\text{C}$ change in temperature between consecutive measurements is recorded. If the water level in a well does not recharge to within 80% of the static water level within one hour, it will be considered impractical to purge the well of three well volumes, and the well will be pumped dry once more and sampled as soon as 80% recharge has occurred.

4.1.4 Portable Submersible Pump (Port-a-Reel System)

An electric submersible pump (2-inch Grundfos® pump) or stainless steel bailer and/or a Teflon® bailer are used to purge water and collect samples at wells not equipped with dedicated systems. The pump is typically used to purge the groundwater while the Teflon® bailer is used for groundwater sample collection. A flow control valve attachment at the bottom of the bailer is used to transfer the sample to the sample containers. The equipment required to purge and collect groundwater samples are:

- Submersible pump (2-inch Grundfos® pump attached to a portable hose reel);
- Water level, pH, temperature, specific conductivity, and turbidity meters;
- Electrical generator;
- Wastewater container;
- Sample truck;
- Teflon® sample bailer, point source check valve, and flow control bottom-emptying assembly;

- Plastic buckets; and
- Hand reel with Teflon® coated stainless steel line or disposable monofilament line.

4.1.5 Portable Submersible Pump Pre-Sampling Procedures

Prior to initiating well purging, all sampling equipment that may come in contact with well water is decontaminated following the procedure described in Section 3 of this FSP. Once decontamination is complete, the following steps are followed prior to purging the well.

1. Measure static water level in the well casing to determine the minimum volume of water needed to be purged from the well prior to collection of groundwater samples. Measure to the nearest 0.01 foot using an electronic water level sounder. Record the levels on the groundwater sampling data sheet.
2. Position the purge pump reel system over the wellhead (hard hats are required for all work involving overhead equipment).
3. Attach the control converter box to the pump and power supply and start the generator.
4. Attach a garden hose to the Port-a-Reel and place it opposite the wastewater container. To prevent siphoning, make sure that hose is not submerged in water in the wastewater container.
5. Attach the power cable to the plug on the power cable reel. Plug the power cable into the generator.
6. Remove a minimum of three times the volume of water initially standing in the well casing during purging of the well using a submersible pump; purge volume is calculated as follows:

minimum purge volume (gallons) – $3 \times V$
 where: V is the volume of water initially standing in the well casing and L is equal to the height of water column above bottom of the well in feet.

$$V = 3.14r^2 L \times 7.48 \text{ gallons/ft}^3$$

The following formula can be used:

total depth = water level x gallons per foot (depends on casing diameter)^a x 3
 times well volume.

- ^a
- for 2-inch well r = 0.163
 - for 4-inch well r = 0.65
 - for 6-inch well r = 1.46

4.1.6 Submersible Pump Micropurge Procedures

The pumping rate for purging groundwater monitoring wells using the micropurge technique should range from 0.25 to 1.0 lpm. Minimal drawdown should occur during micropurging to avoid mixing of stagnant water within the well casing and the

groundwater entering the well from the aquifer material. Drawdown should not exceed 0.5 feet during purging. Wells are purged using micropurge procedures until stabilization of pH (± 0.1 units), temperature ($\pm 1^\circ\text{C}$), and SC ($\pm 5\%$) occurs, usually after approximately two to six sampling system volumes have been purged from the well. Sampling system volumes are calculated as the volume of water standing in the discharge hose of the dedicated pump system.

4.1.7 Submersible Pump Macropurge Procedures

During purging, water parameter measurements, including pH, SC, temperature, and turbidity, are performed periodically on samples of the purge water. These measurements are collected at a minimum of five times (unless well purges dry) over an evenly spaced time interval of the required purge. Results are noted on a groundwater sampling data sheet.

Once the minimum three well volumes have been purged and the measured parameters have stabilized, the well is considered ready for sampling. Groundwater parameters are considered stabilized when less than a 5% change in SC; less than 0.1 unit change in pH; and $\pm 1^\circ\text{C}$ change in temperature occurs between consecutive measurements. If the water level in a well does not recharge to within 80% of the static water level within one hour, the well will be pumped dry once more and sampled as soon as 80% recharge has occurred.

4.1.8 Hand Bailing

Shallow wells with a small water column or wells that produce insufficient water to warrant the use of a pump are purged with a bailer. The equipment required for sampling these “low volume” wells includes:

- Water level sounder;
- Plastic buckets;
- Bailing frame;
- Hand reel;
- Large-volume stainless steel bailer or PVC bailer; and
- Teflon® sample bailer, point source check valve, and flow control bottom-emptying assembly.

4.1.9 Hand Bailing Pre-Sampling Procedures

Prior to initiating well purging, all sampling equipment that may come in contact with well water is decontaminated following the procedure described in Section 3 of this FSP. Once decontamination is complete, the following steps will be followed prior to purging the well.

1. Measure static water level to determine the minimum volume of water that needs to be purged from the well prior to collection of groundwater samples. Measure to the nearest 0.01 foot using an electronic water level sounder. Record the levels on the groundwater sampling data sheet.

2. Calculate the volume of water to be purged from the well using the minimum purge volume formula.
3. Secure large-volume stainless steel or PVC bailer to a stainless steel cable. Using a winch or hand reel, slowly lower the bailer to water level.
4. Purge a minimum of three times the volume water in the casing using the stainless steel or PVC bailer.

4.1.10 Hand Bailing Well Purging Procedures

During purging, water quality measurements, including pH, SC, temperature, and turbidity are performed periodically on samples of the purge water. These measurements are collected six times over an evenly spaced time interval of the required purge. Measurements are noted on the groundwater purge log.

Once the minimum three well volumes have been purged and the measured groundwater parameters have been stabilized, the well is considered ready for sampling. Field parameters are considered stabilized when there is less than a 5% change in SC; less than 0.1 unit change in pH; and $\pm 1^{\circ}\text{C}$ change in temperature between consecutive measurements. Sampling will proceed if at least three well volumes have been purged and all other parameters are stabilized. If the water level in a well does not recharge to within 80% of the static water level within one hour, the well is purged dry once more and sampled as soon as 80% recharge has occurred.

4.1.11 Hand Bailing Sample Collection Procedures

Groundwater samples are collected from all wells by carefully lowering a Teflon® bailer into the water column and allowing the bailer to fill with water. A flow control valve at the bottom of the bailer is used to control sample flow into sample containers for samples collected for volatile analyses; samples for other parameters are collected by carefully decanting the water into sample containers. Sample containers for VOC analyses and other applicable parameters are pre-preserved. VOC samples will be collected first, followed by SVOCs, inorganics, and finally water quality samples.

All groundwater sample containers are pre-chilled at 4°C prior to filling to minimize volatilization and reduce any reactions with the preservatives. All appropriate measures are taken to obtain representative water samples and avoid loss of volatiles in water samples.

4.1.12 Submersible Pump Sample Collection Procedures

Groundwater samples are collected for all wells by carefully lowering a Teflon® bailer into the water column and allowing the bailer to fill with water. The bailer will be lowered below the depth at which the purge pump had been placed. A flow control valve at the bottom of the bailer is used to control sample flow into sample containers for samples collected for volatile analysis; for other parameters, samples are collected by carefully decanting the water into the sample containers. Sample containers for VOC analyses and other applicable parameters are pre-preserved. VOC samples are collected first, followed by SVOCs, inorganics, and finally water quality samples.

All groundwater sample containers will be pre-chilled at 4° C prior to collection of samples to minimize volatilization and reduce any reactions with preservatives. All appropriate measures are taken to obtain representative water samples and avoid loss of volatiles in water samples, including filling the container cap with water, allowing a meniscus to form on the sample, “tapping” each filled container, and checking for any air bubbles.

4.1.13 Groundwater Sump Sampling

Groundwater samples will be collected from the in-line sampling port on the discharge line of the sump pump. If the pump is not running at the desired time of sampling, the pump will be activated using the Grundfos Go-MI 301 infrared remote and online application to connect with Grundfos CU 300 controller that operates the pump. The following protocol will be used.

- Open the weather proof electrical panel that houses the Grundfos CU 300 controller. There is an operations mode light that may be flashing or solid green on the On/Off button. The flashing green light indicates that the pump is off and waiting for input from the pressure transducer to resume pumping. A solid green light indicates the pump is running.
- Connect the Grundfos Go-MI 301 infrared remote to the online application on a cell phone, tablet, or computer using the blue tooth connection.
- Connect to the CU 300 Controller, using the Grundfos Go-MI 301 infrared remote and online application on a cell phone, tablet, or computer.
- From the application Dashboard select Operating Mode, select Max. The pump should turn on and the flashing green light will be solid green.
- Collect the groundwater sample from the inline spigot on the discharge piping in an appropriate container.
- Turn the pump off by selecting Stop from the Operating Mode screen. The solid green light will resume flashing.
- Reset the system to resume running based the programmed set points by turning off the Grundfos CU 300 by holding down the On/Off button for approximately 10 seconds. The green light will turn red. Turn the Grundfos CU 300 back on. The light will turn green and resume pumping based on the programmed set points.

In addition to the information required in Section 6.0, the following information shall be recorded in a field log book each time a sump is sampled and reported in the Quarterly O&M report.

- Measure and record the water level in the sump.
- From the application Dashboard select Status. Record operational data from the Status screen during connection with the Grundfos CU 300 controller including: Power Consumption, Energy Consumption, Operating Hours, and Number of Starts.

- Record the flow meter reading from the in-line Seametrics flow meter/totalizer located on the discharge pipe.

4.2 Leachate Seep Sampling

Small springs of discolored, malodorous leachate, typically found along the lower edges of many landfills, may be the only visible indication of landfill leachate migration. Seeps may represent the intersection of the water table with the land surface, or they may be the discharge from a small perched water table within a landfill. The following protocol will be employed to sample leachate seeps, if observed:

- Grab samples of leachate are obtained at the ground surface where leachate is observed to discharge.
- Temperature, pH and specific conductivity are immediately checked in the field after obtaining each leachate sample. Results are recorded on a field data sheet or field log book.
- The samples are transferred into appropriate containers and stored in a chilled ice chest for transportation to a California certified analytical laboratory. Chain-of-custody documentation accompanies the samples to the laboratory as specified in Section 4.5. Samples analyzed for the appropriate parameters specified in MRP R5-2003-0142.

4.3 Surface Water Sampling

Collect samples so as not to cause cross-contamination. If collecting both water and sediment samples at a specific location, always obtain the water sample first. Measure and record pH, temperature, specific conductance, and dissolved oxygen (when required) at each surface water sampling point. Permanently mark the location where surface water or sediment samples are collected (e.g., flagged stake in stream bank). Record the location on a project map for each specific site or zone.

The sample collection sequence is as follows: (1) if sampling both water and sediment or just sediment, start at the most downstream point and proceed upstream, (2) if sampling water only and the sample can be taken without disturbing the river or stream bottom, obtain any background samples first, then the farthest downstream sample, and then move upstream toward the source or discharge point, and (3) if sampling water only and the stream or river bottom must be disturbed, start at the most downstream point and proceed upstream,

Samples shall be taken from the active portion of the stream on the side nearest the source of contamination or suspected plume. Surface-water samples will be collected by direct filling of sample bottles.

The following records shall be maintained in addition to those in Section 6.0: (1) the width, depth, and flow rate of streams, (2) surface water conditions (e.g., floating oil or debris, gassing), (3) the location of any discharge pipes, sewers, or tributaries, and (4) instrument calibration.

4.4 Sample Handling

Sample containers are purchased, precleaned, and treated according to U.S. EPA specifications for the appropriate methods. Sampling containers that are reused (e.g., soil sleeves) are decontaminated between uses by the U.S. EPA-recommended procedures described in Section 3. Cleaned containers are stored separately at the contractor's staging area to prevent exposure to fuels, solvents, and other chemicals. Amber bottles shall be used for analyses that may be sensitive to photochemical reactions.

4.5 Sample Custody

Procedures to ensure the custody and integrity of the samples begin at the time of sampling and continue through transport, sample receipt, preparation, analysis and storage, data generation and reporting, and sample disposal. Records concerning the custody and condition of the samples are maintained in field and laboratory records.

The contractor shall maintain chain-of-custody records for all field and field quality control (QC) samples. A sample is defined as being under a person's custody if any of the following conditions exist: (1) it is in their possession, (2) it is in their view, after being in their possession, (3) it was in their possession and they locked it up, or (4) it is in a designated, secure area.

All sample containers shall be sealed in a manner that shall prevent or detect tampering if it occurs. In no case shall tape be used to seal sample containers. Samples shall not be packaged with activated carbon.

The following minimum information concerning the sample shall be documented on the chain-of-custody (COC) form (example COC is provided in Appendix A):

- Unique sample identification;
- Date and time of sample collection;
- Source of sample (including name, location, and sample type);
- Designation of matrix spike/matrix spike duplicate (MS/MSD);
- Preservative used;
- Analyses required;
- Name of collector(s);
- Pertinent field data (e.g., pH, temperature);
- Serial numbers of custody seals and transportation cases (if used);
- Custody transfer signatures and dates and times of sample transfer from the field to transporters and to the laboratory or laboratories; and
- Bill of lading or transporter tracking number (if applicable).

All samples shall be uniquely identified, labeled, and documented in the field at the time of collection.

Samples collected in the field shall be transported to the laboratory or field-testing site as expeditiously as possible. When a 4°C requirement for preserving the sample is indicated, the samples shall be packed in ice or chemical refrigerant to keep them cool during collection and transportation. During transit, it is not always possible to rigorously control the temperature of the samples. As a general rule, storage at low temperature is the best way to preserve most samples. A temperature blank (a VOCs sampling vial filled with water) shall be included in every cooler and used to determine the internal temperature of the cooler upon receipt of the cooler at the laboratory.

4.6 Field Quality Control Samples

Field QC samples are used to assess the influence of sampling procedures, equipment, and handling on the reported results. The results of these field samples will be used to assess external contamination, matrix heterogeneity, and total precision associated with both sampling and analytical procedures.

4.6.1 Field Duplicate Samples

Duplicate sample results are used to assess total precision and variability associated with laboratory analysis and sample collection procedures. Duplicate samples are collected simultaneously or sequentially from the same source/location using identical recovery techniques and are handled identically during transportation and analysis.

Because more information can be obtained from samples with detectable concentrations, efforts will be made to select the duplicate samples from areas with the highest potential for contamination. Field duplicates will be collected and analyzed at a rate of approximately 10% of the total number of samples per method and matrix (project-specific requirements may vary). The samples will be collected, numbered, packaged, and sealed in the same manner as other field samples and submitted “blind” to the laboratory.

4.6.2 Trip Blanks

The trip blank consists of a VOC sample vial filled in the laboratory with ASTM Type II reagent grade water, transported to the sampling site, handled like an environmental sample and returned to the laboratory for analysis. Trip blanks are not opened in the field. Trip blanks are prepared only when VOC samples are taken and are analyzed only for VOC analytes. Trip blanks are used to assess the potential introduction of contaminants from sample containers or during the transportation and storage procedures. One trip blank shall accompany each cooler of samples sent to the laboratory for analysis of VOCs.

5.0 FIELD MEASUREMENTS

5.1 Parameters

Numerous instruments and meters will be used in the field during the investigation. The field equipment will be calibrated prior to use, and calibration information will be recorded in a logbook that will remain with the project files. Measurement equipment that may be needed as various field activities are conducted includes an SC meter, pH meter, temperature meter, turbidity meter, and water level indicator. All equipment will be calibrated or checked according to manufacturers' specifications.

5.2 Equipment Calibration and Quality Control

5.2.1 Specific Conductivity

The SC meter will be calibrated over the operating ranges expected in the field. Calibration will be made with a potassium chloride standard solution on each day of use. The calibrating standard will not exceed its expiration date. The battery will be checked regularly. The cell cup or electrode will be washed with deionized (DI) water after each reading, and the cell cup or electrode will be kept clean.

5.2.2 pH Meter

The pH meter will be calibrated prior to use for each day that the unit is used. The calibration will include the setting of the range and span with a 7.0 pH buffer and a 4.0 pH or 10.0 pH buffer, depending on whether acidic or alkaline water conditions are expected. The calibrating standards will not exceed their expiration dates. The calibration of the instrument will be checked at the end of each day of use. The pH electrode will contain sufficient liquid, and the outside of the probe will be kept moist. The electrode will be rinsed after each use with DI water, and the storage cap replaced. If drifting occurs, the probe will be cleaned and recalibrated.

5.2.3 Temperature Meter

Groundwater temperature will be measured using the temperature compensation probe on the pH meter, the SC meter, or with a mercury thermometer that will be decontaminated after each use. The mercury thermometer will be checked for accuracy with a National Institute for Standards and Technology (NIST)-calibrated mercury thermometer. If the field thermometer does not read within ± 2 temperature units of the calibrating unit, a different field thermometer will be used.

5.2.4 Turbidity Meter

The turbidity meter will be calibrated before each well is sampled using a standard supplied by the manufacturer of 0.5 NTU. Care will be taken that no air bubbles are in the standard solution and that the outside of the vial is clean of all marks affecting the reading, including fingerprints. The turbidity meter requires very little periodic maintenance. The battery will be checked to ensure that it has sufficient charge. Sample vials will be kept clean from smudges and dirt, and the entire instrument will be kept clean and dry.

5.2.5 Water Level Indicator and Interface Sensor

The water level indicator and interface sensor will be calibrated before commencement of field activities by checking the markings on the tape against a metal measurement tape. Readings will be recorded to the nearest 0.01 foot. The battery and electrical connections on the water level indicator and the interface sensor will be periodically checked. The cable will be inspected for any breaks or bare wires.

5.3 Equipment Maintenance and Decontamination

All field equipment maintenance procedures shall decontaminated according to the specifications presented in Section 3 of this document.

5.4 Field Monitoring Measurements

5.4.1 Groundwater Level Measurements

Water-level measurements shall be taken in all wells and piezometers to determine the elevation of the water table or piezometric surface at least once within a single 72-hour period. These measurements shall be taken after all wells and piezometers have been installed and developed and their water levels have recovered completely. Any conditions (e.g., barometric pressure) that may affect water levels shall be recorded in the field log. The field log shall also include the previous water level measurement for each well (to determine if current water level is reasonable).

Water-level measurements shall be taken with electric sounders, air lines, pressure transducers, or water-level recorders (e.g., Stevens recorder). Devices that may alter sample composition shall not be used. Pressure gauges, manometers, or equivalent devices shall be used for flowing wells to measure the elevation of the piezometric surface. All measuring equipment shall be decontaminated according to the specifications in Section 3. Groundwater level shall be measured to the nearest 0.01 foot. (Two or more sequential measurements shall be taken at each location until two measurements agree to within + or - 0.01 foot.)

Static water levels shall be measured each time a well is sampled, and before any equipment enters the well. If the casing cap is airtight, allow time prior to measurement for equilibration of pressures after the cap is removed. Repeat measurements until water level is stabilized.

5.4.3 Groundwater Discharge Measurements

Groundwater discharge measurements shall be obtained during monitor well purging. Groundwater discharges may be measured with orifice meters, containers of known volume, in-line meters, flumes, or Weirs, following the guidelines specified in the *Water Measurement Manual*, Bureau of Reclamation, 1967. Measurement devices shall be calibrated using containers of known volume.

6.0 RECORD KEEPING

This section describes field data documentation procedures for field logbooks, groundwater sampling labels, and COC forms. Examples of the documentation sheets for field activities are provided in Appendix A.

6.1 Daily Field Sheets or Logbook

Field data sheets or logbooks will provide the means of recording data collection activities. As such, entries will be described in as much detail as possible so that persons going to the site could reconstruct a particular situation without reliance on memory. The data sheets will be assigned to field personnel each day, or logbooks will be assigned for each field event. Daily field data sheets will be bound at the end of each event.

The data sheet or logbook shall contain the following information:

- Sampling team;
- Date;
- Well number;
- Volume purged;
- Samples collected;
- Quality assurance/quality control (QA/QC);
- Visitors;
- Problems; and
- Comments.

Measurements made and samples collected will be recorded. All entries will be made in indelible black ink, and no correction fluid will be allowed. If an incorrect entry is made, the information will be crossed out with a single strike, initialed, and dated. The number of the photographs taken of the site, if any, will also be noted. All equipment used to make measurements will be identified, along with the date of calibration.

Samples will be collected following the sampling procedures documented in Section 4.0. The equipment used to collect samples will be noted, along with the time of sampling, sample description, depth at which the sample was collected, sample volume, and number of containers filled. Sample identification numbers will be assigned prior to sample collection. Field duplicate samples, which will receive an entirely separate sample identification number, will be noted under sample description.

6.2 Water Sampling Data Sheet

The water sampling data sheet will be used during groundwater and surface water sampling activities (Appendix A). During groundwater and surface water sampling, the following information will be recorded:

- Installation name;
- Project;
- Location ID;
- Static water level (before sampling);
- Sampling method;
- Date/time;
- Field parameters measured (pH, SC, and temperature);
- Initials of field technician(s);
- Weather conditions;
- Equipment calibration information; and
- Total number of samples collected and a description of the analyses.

6.3 Sample Labels

A sample label will be affixed to all sample containers sent to the laboratory. This identification label will be completed with the following information:

- Project name and location;
- Sample location;
- Field identification number;
- Date and time of sample collection;
- Initials of sampler;
- Preservative used; and
- Analysis required.

After samples have been collected and the information entered onto the appropriate sampling data sheets and labels, a COC record will be completed, as described in Section 4.5.

7.0 DATA REVIEW, VALIDATION, AND AUDITS

The data review, reporting, and validation procedures described in this section will ensure that (1) complete documentation is maintained, (2) transcription and data reduction errors are minimized, (3) the data are reviewed and documented, and (4) the reported results are qualified, if necessary. Laboratory data reduction and verification procedures are required to ensure that the overall objectives of analysis and reporting meet method and project specifications. To ensure consistency, H&K uses the technical system audit checklist for both laboratory procedures and field procedures, which will ensure that the overall objectives of sample collection and analysis meet method and project specifications.

7.1 Data Review, Validation, and Reporting Requirements for Definitive Data

Scientifically sound data that are of known and documented quality and meet project quality objectives (PQOs) are essential for use in the decision making process. Records for document data review and validation activities are required for effective assessment of the data quality and usability. This is accomplished through a series of data reduction and review steps which involve multiple levels in accordance with the principles of good laboratory practice. The data can then move forward with attached qualifiers for assessment identifying the overall usability of the data. These data are reported in hard copy data packages and electronic deliverables. The steps of the various levels of data verification, validation, and reporting must be clearly defined and be appropriate for the project-specific decision goals. Data reduction procedures, whether performed by instrumentation or manually, shall follow methodologies specified in the laboratory SOPs or approved analytical methods. Project-specific variation of the general procedures, statistical approach, or formulas must be identified according to project-specific requirements.

7.1.1 Laboratory Data Review Requirements

All analytical data generated by the laboratory shall be verified prior to submittal. This internal data review process, which is multi-tiered, shall include all aspects of data generation, reduction, and QC assessment. Procedures for laboratory verification of data shall be summarized in the project QAPP. In each laboratory analytical section, the analyst performing the tests shall review 100% of the definitive data. After the analyst's review has been completed, 100% of the data shall be reviewed independently by a senior analyst or by the supervisor of the respective analytical section using the same criteria.

The following elements for review/verification at each level must include but not be restricted to:

- Sample receipt procedures and conditions.
- Sample preparation.
- Appropriate SOPs and analytical methodologies.
- Accuracy and completeness of analytical results.
- Correct interpretation of all raw data, including all manual integrations.

- Appropriate application of QC samples and compliance with established control limits.
- Verification of data transfers.
- Documentation completeness (e.g., all anomalies in the preparation and analysis have been identified, appropriate corrective actions have been taken and documented in the case narrative, associated data have been appropriately qualified, and anomaly forms have been completed).
- Accuracy and completeness of data deliverables (hard copy and electronic).

7.1.2 Laboratory Data Reporting Requirements

The case narrative contains essential information that affords an informed evaluation of data usability. The case narrative shall include but not be limited to:

- A table summarizing samples received, correlated field sample numbers, laboratory sample numbers, and laboratory tests completed.
- A discussion of sample appearance and integrity issues which may affect data usability (temperature, preservation, pH, sample containers, air bubbles, multiphases, etc.).
- Samples received but not analyzed and the reason why.
- A discussion of holding time excursions for sample prep and analyses.
- Analysis of all out-of-control or discrepancies of calibrations, continuing calibrations or QC sample results (surrogates, laboratory control sample [LCS], MS/MSD, post-digestion spikes, etc.), raw data/chromatograms, and corrective actions taken.
- Identification of samples and analytes for which manual integration was necessary.
- A discussion of all qualified data and a definition of qualifying flags.
- A discussion of and recommendations for potential data usability of qualified data including a detailed discussion of conditions associated with R-flagged data.

All reports shall include the following:

- Method detection limits (MDLs) and sample results should be reported to one decimal place more than the corresponding RL, unless the appropriate number of significant figures for the measurement dictates otherwise.
- Soil samples shall have results reported on a dry weight basis. A wet weight aliquot of sample equivalent to the method-specified dry weight aliquot of sample should be taken for analysis. Alternatively, the lab may choose to use a consistent wet weight aliquot that is expected to be large enough to compensate for the moisture in the sample (e.g., 50% more) and use this as a consistent weight.

Note: RLs are project-specific requirements and are NOT adjusted for sample moisture. Detection limits may have to be adjusted for moisture; however, the

laboratory should ensure that the minimum relationship between adjusted MDLs and corresponding RLs are maintained.

- If possible, samples should be analyzed undiluted and non-detects reported to the AFCEE-specific RLs. RLs for minority constituents in highly contaminated samples may have to be adjusted for dilutions.

7.1.3 Data Qualifiers

Data qualifiers shall be applied in the laboratory following Table 7.1-1 and reviewed by the supervisor of the respective analytical section, after the first and second level reviews of the laboratory data have been performed. The allowable data qualifiers for definitive data are R, M, J, F, B, and U. Flagging criteria for the contractor for definitive data are shown in Tables 7.1-2 through 7.1-4 for the various instrumentation. The prime contractor must first evaluate the flags applied by the laboratory and, using professional judgment, provide modifications or clear justification for any modifications based on project-specific quality objectives.

Table 7.1-1. Laboratory Data Qualifiers

Qualifier		Description	
J		The analyte was positively identified, the quantitation is an estimation.	
U		The analyte was analyzed for, but not detected. The associated numerical value is at or below the MDL.	
F		The analyte was positively identified but the associated numerical value is below the RL.	
R		The data are rejected due to deficiencies in the ability to analyze the sample and meet QC criteria.	
B		The analyte was found in an associated blank, as well as in the sample.	
M		A matrix effect was present.	
S		To be applied to all field screening data.	
T		Tentatively identified compound (using GC/MS)	
UJ		The analyte was analyzed for but not detected at or above the RL; however, the RL is considered an estimated concentration.	
GC	=	gas chromatography	QC = quality control
MDL	=	method detection limit	RL = reporting limit
MS	=	matrix spike	

Table 7.1-2. Data Flagging Convention for Metals Analyses

Quality Control Item	Evaluation	Data Qualifier Flag			
		Detects		Nondetects	Sample(s) Qualified
		Non Biased	Biased		
Holding times	1. Holding time exceeded by 2 times or less	J	J-	UJ	Sample
	2. Holding time exceeded by greater than 2 times	J	J-	R	
Initial calibration	1. $r < 0.995$	J	J	UJ	All samples associated with initial calibration (Run Batch)
Initial calibration verification	1. % Recovery > 110% but ≤ 125% (Hg, % Recovery > 120% but ≤ 135%)	J	J+	No qual.	All samples associated with initial calibration verification (Run Batch)
	2. % Recovery > 125% (Hg, % Recovery > 135%)	R	R	No qual.	
	3. % Recovery < 90% but ≥ 75% (Hg, % Recovery < 80% but ≥ 65%)	J	J-	UJ	
	4. % Recovery < 75% (Hg, % Recovery < 65%)	J	J-	R	
Calibration verification	1. % Recovery > 110% but ≤ 125% (Hg, % Recovery > 120% but ≤ 135%)	J	J+	No qual.	All samples associated with continuing calibration (Analysis Batch)
	2. % Recovery > 125% (Hg, % Recovery > 135%)	R	R	No qual.	
	3. % Recovery < 90% but ≥ 75% (Hg, % Recovery < 80% but ≥ 65%)	J	J-	UJ	
	4. % Recovery < 75% (Hg, % Recovery < 65%)	J	J-	R	
Method blank contamination	Sample results less than or equal to 5 times the blank contamination	U	U	No qual.	All samples in the same Preparation Batch

Table 7.1-2. (Continued)

Quality Control Item	Evaluation	Data Qualifier Flag			Sample(s) Qualified
		Detects		Nondetects	
		Non Biased	Biased		
Matrix spike recovery	1. % Recovery < 80% but ≥ 30%	J	J-	UJ	All samples in the same Method Batch
	2. % Recovery < 30%	J	J-	R	
	3. % Recovery > 120%	J	J+	No qual.	
	4. RPD > CL	J	J	UJ	
Laboratory control sample recovery	1. % Recovery < 80% but ≥ 50%	J	J-	UJ	All samples in the same Preparation Batch
	2. % Recovery < 50%	J	J-	R	
	3. % Recovery > 120%	J	J+	No qual.	
	4. RPD > CL	J	J	UJ	
Reporting limits	1. Reporting limits not matching the project specified limits	No qual.	No qual.	No qual.	Sample (noted in outlier report)
	2. Reported result less than the project reporting limit	J	J	No qual.	Sample
Field duplicates	RPD > CL	No qual.	No qual.	No qual.	Non-compliant results listed in QA report
Field blanks Equipment blanks	Sample results within 5 times blank contamination	U	U	No qual.	All samples in the same sampling event
CL = confidence limit Hg = mercury QA = quality assurance qual. = qualification RPD = relative percent difference					

Table 7.1-3. Data Flagging Convention for Organic Methods

Quality Control Item		Data Qualifier Flag			
		Detects		Nondetects	Sample(s) Qualified
		Non Biased	Biased		
Holding times (extraction/analysis)	1. Holding time exceeded by 2 times or less	J	J-	UJ	Sample
	2. Holding time exceeded by greater than 2 times	J	J-	R	
Cooler temperature	1. > 6 degrees and ≤10 degrees Centigrade	J	J-	UJ	All samples shipped in the affected cooler (Shipping Batch)
	2. > 10 degrees Centigrade	J	J-	R	
	3. < 2 degrees Centigrade	No qual.	No qual.	No qual.	
Initial calibration	1. % RSD > 20%	J	J	UJ	All samples associated with initial calibration (Run Batch)
	2. r < 0.995	J	J	UJ	
Initial calibration verification	1. % Difference > +20%	J	J+	No qual.	All samples associated with initial calibration verification (Run Batch)
	2. % Difference < -20% and ≥ -50%	J	J-	UJ	
	3. % Difference < -50%	J	J-	R	
Continuing calibration verification	1. % Difference > +20%	J	J+	No qual.	All samples associated with continuing calibration (Analysis Batch)
	2. % Difference < -20% or ≥ -50%	J	J-	UJ	
	3. % Recovery < -50%	J	J-	R	
Method blank contamination	1. Common laboratory contaminant results less than or equal to 10 times the blank contamination	U	U	No qual.	All samples in the same Preparation Batch
	2. Other compound results less than or equal to 5 times the blank contamination	U	U	No qual.	
Surrogate recovery	1. % Recovery < CL but ≥ 10%	J	J-	UJ	Sample
	2. % Recovery < 10%	J	J-	R	
	3. % Recovery > CL	J	J+	No qual.	
Matrix spike recovery	1. % Recovery < CL but ≥ 10%	J	J-	UJ	Parent sample
	2. % Recovery < 10%	J	J-	R	
	3. % Recovery > CL	J	J+	No qual.	
	4. RPD > CL	J	J	UJ	

Table 7.1-3. (Continued)

Quality Control Item		Data Qualifier Flag			
		Detects		Nondetects	Sample(s) Qualified
		Non Biased	Biased		
Laboratory control sample recovery	1. % Recovery < CL but ≥ 10%	J	J-	UJ	All samples in the same Preparation Batch
	2. % Recovery < 10%	J	J-	R	
	3. % Recovery > CL	J	J+	No qual.	
	4. RPD > CL	J	J	UJ	
Reporting limits	1. Reporting limits not matching the project specified limits	No qual.	No qual.	No qual.	Sample (noted in outlier report)
	2. Reported result less than the project reporting limit	J	J	No qual.	Sample
Field duplicates	RPD > CL	No qual.	No qual.	No qual.	Non-compliant results listed in the ADR outlier report
Field blanks Equipment blanks	1. Common laboratory contaminant results within 10 times blank contamination	U	U	No qual.	All samples in the same sampling event
	2. Other laboratory contaminant results within 5 times blank contamination	U	U	No qual.	
Trip blanks	1. Common laboratory contaminant results within 10 times blank contamination	U	U	No qual.	All samples in the same Shipping Batch
	2. Other laboratory contaminant results within 5 times blank contamination	U	U	No qual.	

ADR = adjustable design rate
 CL = confidence limit
 GC = gas chromatograph
 qual. = qualification
 r = response
 RPD = relative percent difference
 RSD = relative standard deviation

The one exception to these data flagging criteria rules applies to the tentatively identified compounds (TICs) that are identified only in the GC/MS methods. These TICs' numerical results will always be qualified with one and only one flag for any reason, and that is the "T" flag.

The laboratory QA section shall perform a 100% review of 10% of the completed data packages, and the laboratory project representative shall complete a final review on all the completed data packages.

7.1.4 Laboratory Requirements

The chemistry data package shall contain information that facilitates external review, validation, and assessment.

MDLs and sample results shall be reported to one decimal place more than the corresponding RL, unless the appropriate number of significant figures for the measurement dictates otherwise. Soil samples shall have results reported on a dry weight basis. A wet weight aliquot of sample equivalent to the method specified by dry weight aliquot of sample should be taken for analysis.

Alternately, the lab may choose to use a consistent wet weight aliquot that is expected to be large enough to compensate for the moisture in the sample (e.g., 50% more) and use this as a consistent weight. RLs are NOT adjusted for sample moisture. If possible, samples should be analyzed undiluted and non-detects reported to the specified RLs. RLs for minority constituents in highly contaminated samples may be adjusted for dilutions.

7.1.5 Data Verification and Validation by the Prime Contractor

The ultimate goal of data verification and data validation is to ensure that the decisions that are made as a result of the environmental data collection effort are supported by data of the type and quality suitable for their intended use.

Data verification is a preliminary step to data validation. Data verification, as used in this section, refers to the systematic process of evaluating the completeness and compliance of the data with the pre-defined requirements of the project, including method, procedural, and contractual requirements.

Data validation is a sample- and analyte-specific process that extends to the evaluation of the data beyond verification to determination of their usability in the context of the project goals. Data validation includes a determination, to the extent possible, of the reasons for any failure to meet method, procedural, or contractual requirements, and an evaluation of the impact of such failures on the usability of the data.

There are various levels of effort for data validation. The level of effort used depends upon the PQOs and established data use as specified by the project scope of work. The appropriate data deliverable package should also be defined based upon the level of data review required by the project objectives.

At a minimum, the standard data package should document that definitive data are produced using rigorous analytical methods, such as EPA standard referenced methods (e.g., SW846) and that analyte presence and quantitation are confirmed using extensive

QC procedures at the laboratory. The standard data package shall include, at a minimum, a cover sheet, table of contents, case narrative, analytical results, laboratory reporting limits, sample management records, and internal laboratory QA/QC information.

The project chemist shall review the entire definitive data report package, and with the field records, apply the final data qualifiers for the definitive data. Attachment B provides examples of data evaluation checklists. The laboratory shall apply data qualifying flags to each environmental field QC sample, i.e., ambient blanks, equipment blanks, trip blanks, field duplicates, MS samples, and MSD samples. The prime contractor shall review the field QC samples and field logs, and shall then appropriately flag any of the associated samples identified with the field QC sample, as explained in Figure 7-1 and Tables 7.1-2 through 7.1-4. Each MS sample shall be qualified only by the laboratory, while the prime contractor shall apply the final qualifying flag for a matrix effect to all samples collected from the same site as the parent sample or all samples showing the same lithologic characteristics as the MS/MSD.

Depending upon the project objectives and intended use of the data, a more rigorous data validation regimen may be required. This more extensive review requires a more comprehensive data deliverable package. This data package contains sufficient information to completely reconstruct the chemical analyses and includes all batch QC results, instrument QC results (e.g., initial calibration verification, continuing calibration verification, and instrument performance checks), MDL studies, and raw data (e.g., run logs, sample preparation logs, standard preparation logs, and printed instrumental output such as chromatograms).

7.1.5.1 Responsibility and Qualifications

The responsibility for data verification and validation will be assigned to the primary contractor. The data validation process involves exercising professional judgment. Regardless of who performs data validation, the individuals should possess the disciplinary expertise, experience, and theoretical knowledge to perform the task. It is also imperative that these individuals possess a complete understanding of the intended use of the data and the relationship of the QC results to the usability of the data. For this reason, it is essential that they be involved during the systematic planning process, choice of preparation and analytical methods, and decisions made regarding data verification and data validation. All project planning documents and procedures, as well as sample collection information, must be made available to the individuals assigned to the task.

7.1.5.2 Data Verification Guidelines

Data verification may be done electronically or manually, or by a combination of both. Data verified may include but is not limited to:

- Sampling documentation (chain-of-custody form, etc.).
- Preservation summary and technical holding times.
- Presence of all analyses and analytes requested.
- Use of the required sample preparation and analysis procedures.

- The method detection and reporting limits evaluated against the project requirements.
- The correctness of the concentration units.

Instrument calibration and QC parameters (method-specific) shall be reviewed for compliance with the criteria specified in the applicable summary of calibration and QC procedures tables, and flagged as necessary. Each MS sample shall only be qualified by the laboratory, while the prime contractor shall apply any additional qualifying flag for a matrix effect to all samples collected from the same site as the parent sample or all samples showing the same lithologic characteristics as the MS/MSD:

- Review of raw data and inspection of chromatograms.
- Review of system performance.
- TICs data.
- Estimated results (F qualifiers).
- Certified analysts.
- Case narrative.

7.1.5.3 Data Validation Guidelines

The data validation process follows data verification. It can involve an in-depth review of the raw data to verify accuracy followed by analysis and interpretation of the data in the context of the project objectives and end-use.

7.1.5.3.1 Raw Data Review

Raw data review may include but is not limited to:

- Review for proper integration (if applicable).
- Review of spectral matches and/or retention times to verify analyte identification (where applicable).
- Random checks of calculations, including but not limited to sample QC results, initial calibration response factors, relative standard deviations, calibration verification standard response factors, and percent differences or percent drifts from the expected values.
- Checks for interference problems or system performance problems, such as chromatographic baseline anomalies and drifts, evidence of column degradation, etc.
- Resolution by the laboratory of any identified problems, as necessary.

7.1.5.3.2 Data Analysis and Interpretation

The data validation process (assessment) relies heavily on the validator's professional judgment. It may include but is not limited to:

- Evaluation of the impact of multiple data issues on the final analytical results (for example, variability of results obtained from different dilutions, or different methods; chromatographic issues; etc.).

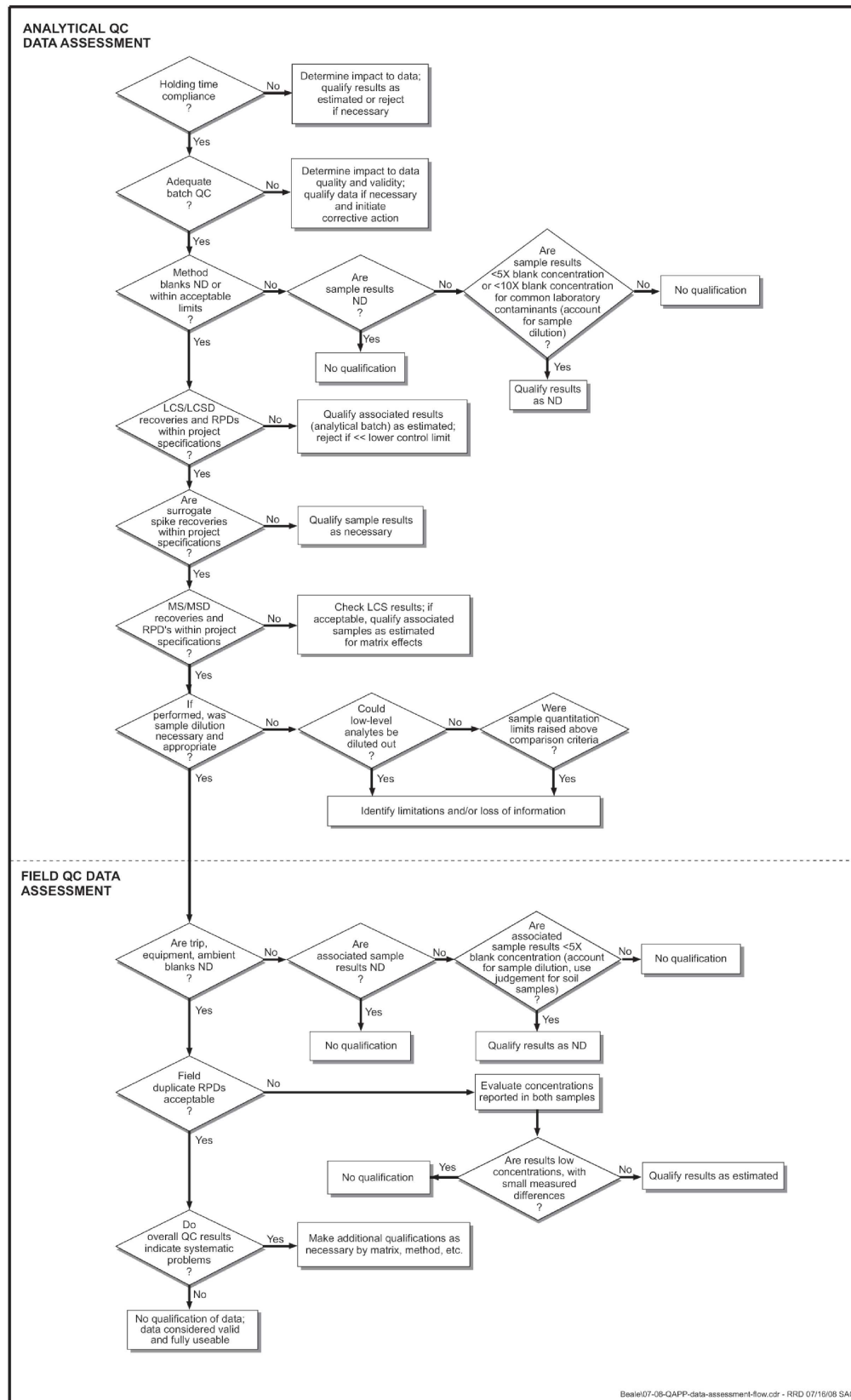


Figure 7-1. QC Data Assessment Flowchart

- Evaluation of the deficiencies identified during data verification and assessment of their impact on the sample results.
- Incorporation of site-specific factors and assessment of their impact on the data.
- Assessment of data usability and assignment of final data qualifiers, as necessary.
- Discussion of completeness, representativeness, and comparability.

A data validation report will be prepared summarizing the findings and discussing their impact on the overall data usability.

7.2 QA Reports

The laboratory QA staff shall issue QA reports to laboratory management, laboratory supervisors, and task leaders, as required. These reports shall describe the results of QC measurements, performance audits, systems audits, and confirmation sample comparisons performed for each sampling and analysis task. Quality problems associated with performance of methods, completeness of data, comparability of data including field and confirmatory data, and data storage shall be documented with the corrective actions that have been taken to correct the deficiencies identified. These electronic data will be submitted for all definitive data analysis and will include, at a minimum, batch QC results required by the various methods.

7.3 Electronic Data Reports

The prime contractor shall provide an electronic deliverable report in the Geotracker format as specified by the statement of work for the project.

APPENDIX A
FSP Forms

Water Sample Data Sheet

GROUNDWATER SAMPLING FORM

Well No.

Project Name:

Location:

Project Number:

Site:

☐ Active
☐ Abandoned

Area:

☐ Surfaced
☐ Unsurfaced

Project Manager:

Monument:

☐ Above Level
☐ Below Level
☐ At Level

☐ Good
☐ Broken

Technician:

Locked?

☐ Yes
☐ No

Sampling Date:

Contains Water:

☐ Yes
☐ No

☐ Above Cap
☐ Below Cap

Well Type:

☐ Monitoring
☐ Extraction
☐ Other

TOC Elevation:

WELL PURGING

PURGE VOLUME CALCULATIONS:

(

Well Depth (feet)

-

Depth to Water (ft)

)

x

Casing Diameter (in)

²

x

Casing Volumes

3

x

=

0.0

gallons

Calculated Purge Volume

OBSERVATION OF PURGE WATER:

Odor:

☐ No
☐ Yes

If Yes, odor is:

☐ Gas
☐ Diesel
☐ Other Hydrocarbon
☐ Decaying Organic

Free Product Layer:

☐ No

If Yes, thickness is:

Any type of sheen?

☐ No

If Yes, streaks, globs, dots...?

PURGING METHOD:

☐ Bailer

Size:

Material:

Disposable:

☐ Yes
☐ No

☐ Submersible Pump

FIELD PARAMETER MEASUREMENT:

Start Time:

Stop Time:

Time	Total Gallons Removed	pH	Conductivity (umhos/cm3)	Temperature	Odor	Observations (color, turbidity, cloudiness, etc.)

WELL SAMPLING

SAMPLING METHOD:

Bailer Type:

Size:

Well No.	Sample No.	Time	Container Size / #	Analyses Requested	Preservatives	Laboratory

QUALITY CONTROL SAMPLES:

Sample Type	Sample No.	Time	Container Size / #	Analyses Requested	Preservatives	Laboratory
Trip Blank						
Field Blank						
Duplicate						

Chain-of-Custody Record

Example Operation & Maintenance Report

April 20, 2016
Project No.: 70472-02PW

Mr. Ray Leftwich, P.E.
City Engineer
City of Lincoln Department of Public Services
600 Sixth Street
Lincoln, California 95648

REFERENCE: Closed Lincoln Landfill

Waste Discharge Order No. R5-2003-0142
Cleanup and Abatement Order No. R5-2014-0703
1120 Virginiatown Road, Lincoln, Placer County, California

SUBJECT: Operation & Maintenance Report – February and March 2016

Dear Mr. Leftwich,

Holdrege & Kull (H&K) prepared this operations and maintenance (O&M) report for the Closed Lincoln Landfill cutoff trench dewatering system located at 1120 Virginiatown Road, Lincoln, California. A site location map and a site layout map are provided as Figures 1 and 2, respectively. The purpose of this report is to document monthly monitoring performed in accordance with the H&K September 30, 2014 Corrective Action Work Plan (CAWP). Corrective action at the Closed Lincoln Landfill is required by Waste Discharge Requirements Order No. R5-2003-0142 and Cleanup and Abatement Order (CAO) No. R5-2014-0703.

This report summarizes O&M activities performed for February and March 2016. H&K recorded discharge volumes, depth to groundwater, number of pump starts, operating hours, energy consumption, and total discharge at each sump location. In addition, groundwater levels were measured in each of the 21 site groundwater monitoring wells.

The system was continuously operated during the months of February and March with no planned or unplanned shut downs.

SYSTEM DISCHARGE

Discharge volumes from each sump were recorded from the inline flow meters on February 23 and March 22, 2016. Table 1 provides a summary of system discharge data, calculated discharge rates, and operational data. Total cumulative discharge from the system was 557,955 gallons in February and 669,060 gallons in March. H&K calculated average daily discharge rates for February and March of approximately 3,825 and 3,968 gallons per day (gpd). These flow rates are consistent with previous data.

Table 1 provides a summary of total average daily system discharge and cumulative discharge produced from each sump.

GROUNDWATER ELEVATIONS

Groundwater elevations were measured in each sump and the 21 site groundwater monitoring wells and piezometers. Table 1 summarizes the groundwater elevations in the sumps and Table 2 summarizes groundwater elevations in site monitoring wells. Hydrographs for the sumps and groundwater monitoring wells are provided as Figures 3 and 4, respectively. The system has drawn down, and appears to be maintaining, water levels in sumps SS1, SS2, and SS4 at elevations between 177.25 and 180.59 feet mean sea level (msl). Groundwater levels in sump SS3 show a slightly increasing trend, however, the groundwater elevation in this portion of the site is lower than the compliance elevation of 184.6 feet msl, and thus no pumping is needed.

During March, groundwater elevations in 7 of the 8 onsite wells (MW-2, MW-9, MW-12, MW-21, PZ-1A [dry], PZ-2A [dry] and PZ-2B) were less than the compliance elevation of 184.6 feet msl (Figure 4). The groundwater elevation in PZ-1B continued to show decreasing trends through February; increased in March and remains at an elevation greater than the compliance elevation.

SYSTEM DISCHARGE WATER QUALITY

In accordance with the CAWP (H&K, 2014), groundwater samples were collected to characterize total dissolved solids (TDS) concentrations in system discharge. H&K collected groundwater samples from sumps SS1, SS2, and SS4 on February 23 and March 22, 2016. The water level at SS3 is below the level at which pumping is needed, thus no samples were collected.

Groundwater samples were collected in laboratory supplied containers and placed on ice pending transport to Basic Laboratory, Inc. of Chico, California (ELAP No's. 1677 and 2718). Samples were analyzed for TDS by Standard Method (SM) 2540C. The laboratory reports and chain-of-custody data are attached. Laboratory results are summarized in Table 3.

During February 2016, TDS was detected in groundwater samples collected from SS1, SS2, and SS4 at concentrations of 290, 322, and 1,170 milligrams per liter (mg/L), respectively. During March 2016, TDS was detected in groundwater samples collected from SS1, SS2, and SS4 at concentrations of 309, 319, and 1,150 mg/L, respectively. The concentrations at SS1 and SS2 are representative of background concentrations of TDS in groundwater upgradient of the landfill. While the concentration detected in the sample collected from SS4 is representative of a near source area.

A flow weighted average TDS concentration was calculated for the February 23 and March 22, 2016 sampling events using concentrations detected from sumps SS1, SS2, and SS4 and total discharge from each sump. The flow weighted average TDS concentrations for the combined discharge were 509 (February) and 532 (March) mg/L (Table 3).

CONCLUSIONS

H&K concludes the following based on data collected during December.

- Groundwater elevations in sumps SS1, SS2, and SS4 are being maintained below the compliance elevation by the system pumps.
- Groundwater elevations in onsite monitoring wells are being influenced by system operations and are lower than the compliance elevation in 7 of the 8 wells/piezometers. Groundwater elevations in piezometer PZ-1B remain at elevations greater than the compliance elevation.
- The flow weighted TDS concentration of the combined system discharge was 509 and 530 mg/L.
- Average daily flow rate for February and March 2016 was 3,825 and 3,968 gpd and is consistent with previous data.

CLOSING

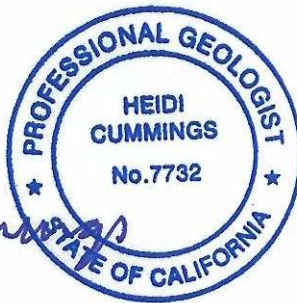
If you should have questions or comments, please do not hesitate to call the undersigned at (530) 894-2487 or email Ms. Cummings at hcummings@handk.net.

Sincerely,

Holdrege & Kull



Heidi Cummings, PG
Senior Geologist



Donald M. Olsen, PE
Principal Engineer



cc: Eric Ziggler (eric.ziggler@stantec.com)

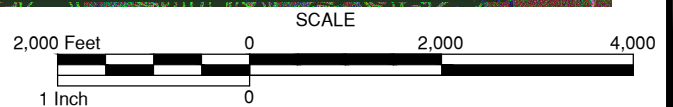
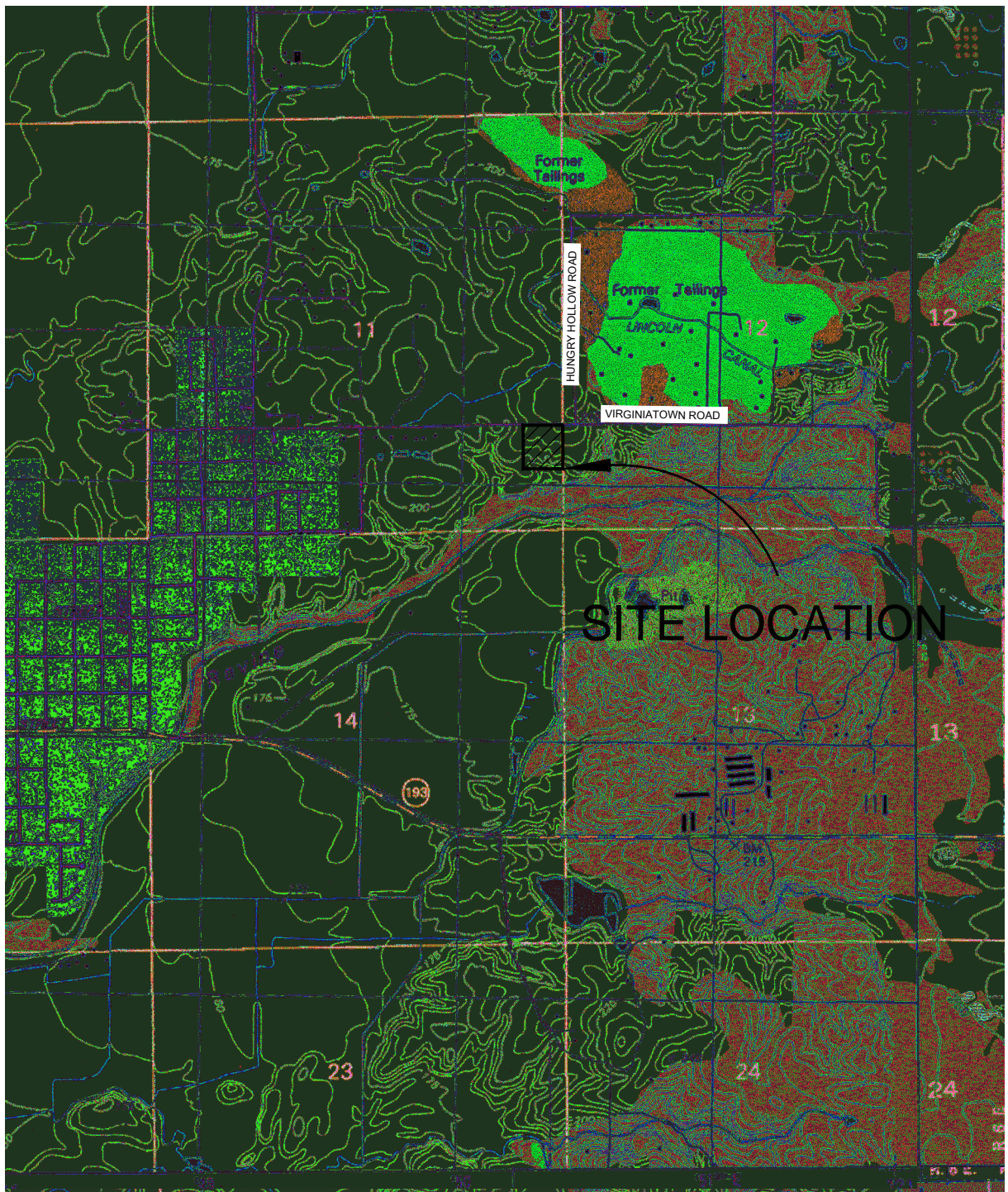
Attachment: Laboratory Reports and Chain-of-Custody Documentation

Figures

- 1 Site Location Map
- 2 Site Layout Map
- 3 Sump Groundwater Elevation Hydrograph
- 4 Groundwater Elevation Hydrograph for Wells Inside the Property Boundary

Tables

- 1 Sump Operational Data
- 2 Groundwater Elevation Data
- 3 Groundwater Analytical Results



Notes:



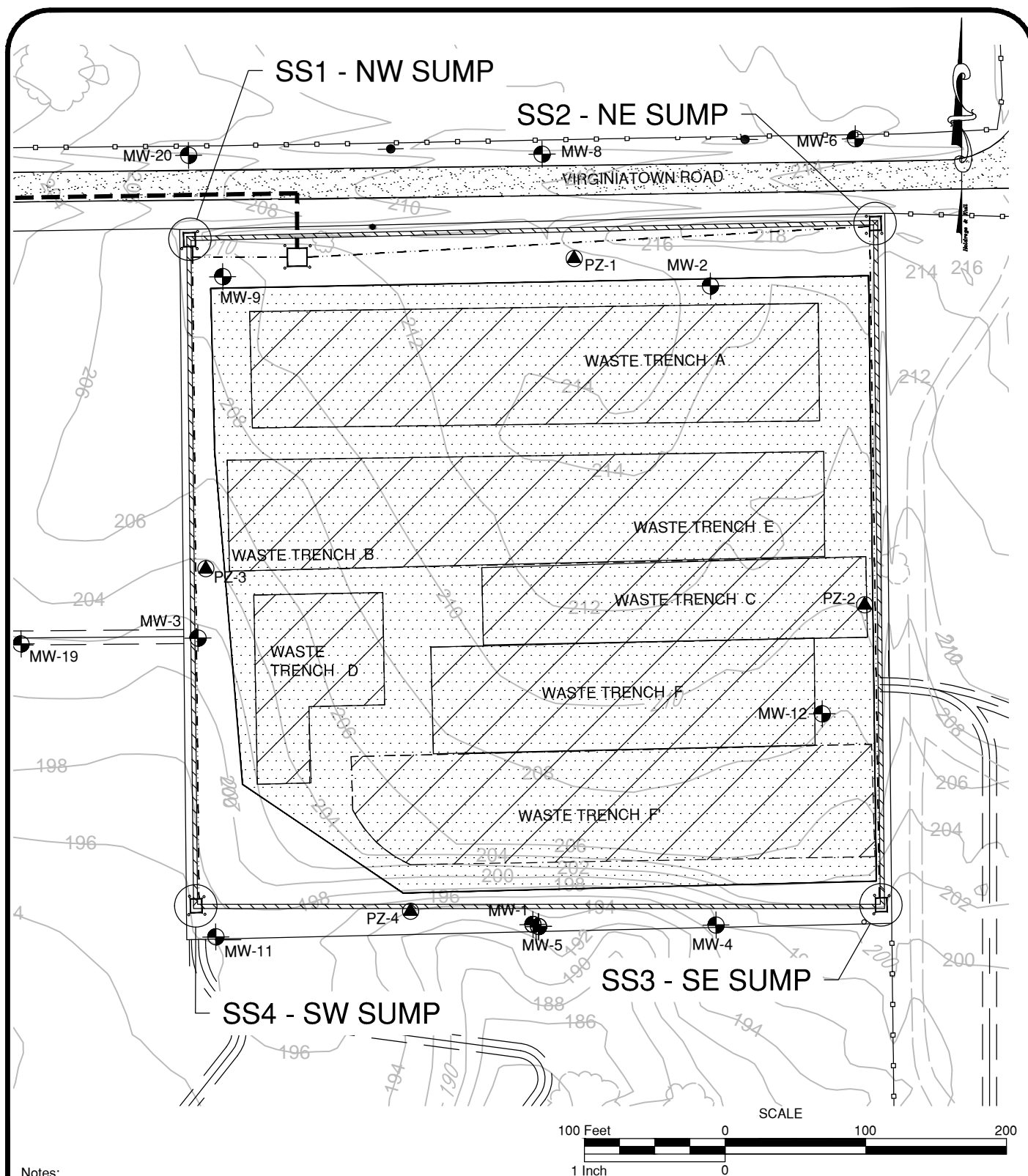
8 Seville Court, Suite 100
Chico, California, 95928
Phone 530-894-2487, Fax 530-894-2437

SITE LOCATION MAP
CLOSED LINCOLN LANDFILL
1120 VIRGINIATOWN ROAD
LINCOLN, PLACER, CALIFORNIA

DRAWN BY: HJC
CHECKED BY: DMO
PROJ. NO.: 70472-02
DATE: APRIL, 2016

FIGURE NO.:

1



Notes:



8 Seville Court, Suite 100
Chico, California, 95928
Phone 530-894-2487, Fax 530-894-2437

SITE MAP

Lincoln Closed Landfill
Perimeter Dewatering Trench
1120 Virginiatown Road
Lincoln, Placer County, CA

DRAWN BY: HJC

CHECKED BY: DMO

PROJ. NO.: 70472-02

DATE: APRIL, 2016

FIGURE NO.:

2

Figure 3. Sump Groundwater Elevation Hydrograph
Closed Lincoln Landfill, Lincoln, California

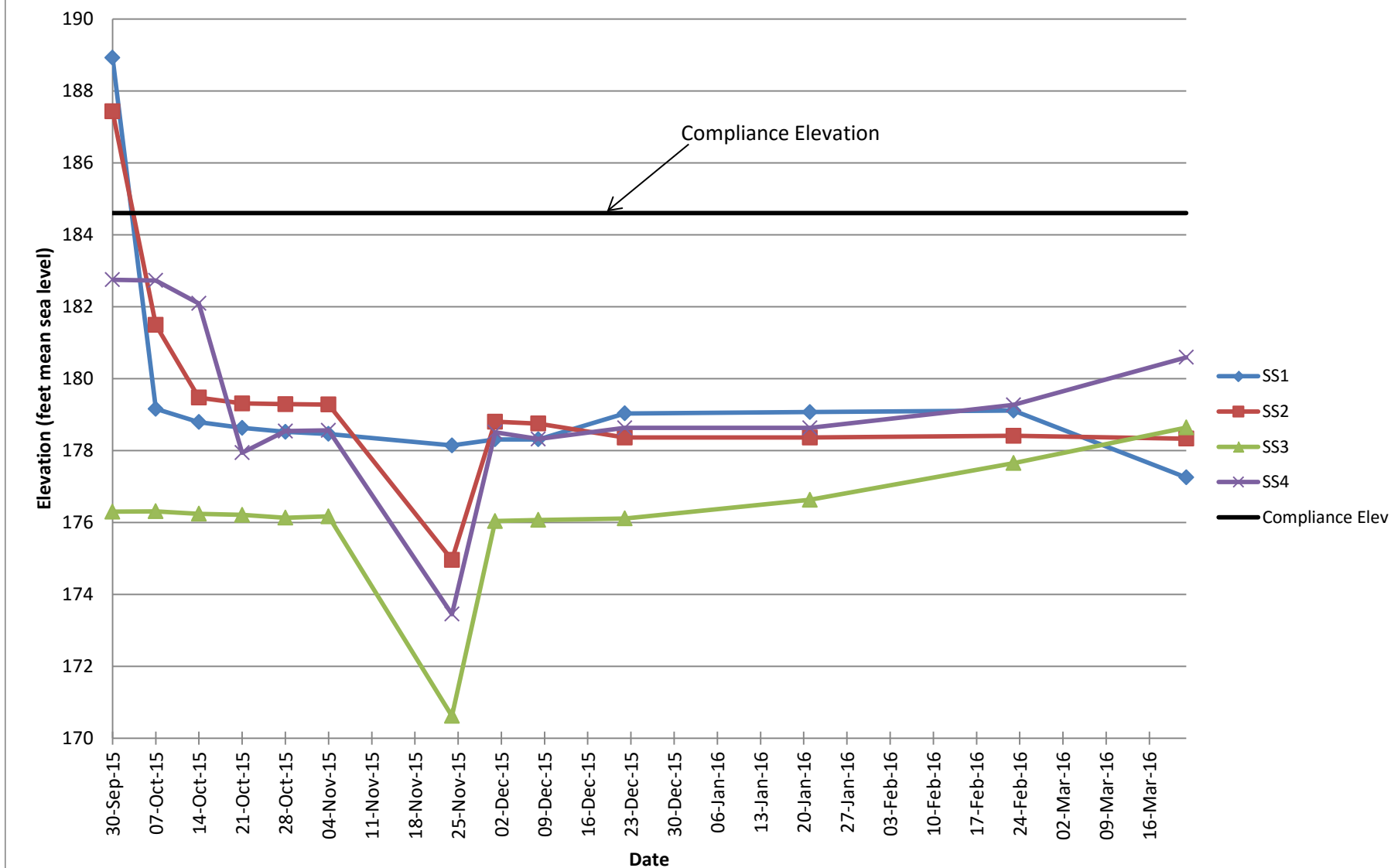


Figure 4. Groundwater Elevation Hydrograph for Wells Inside the Cutoff Trench

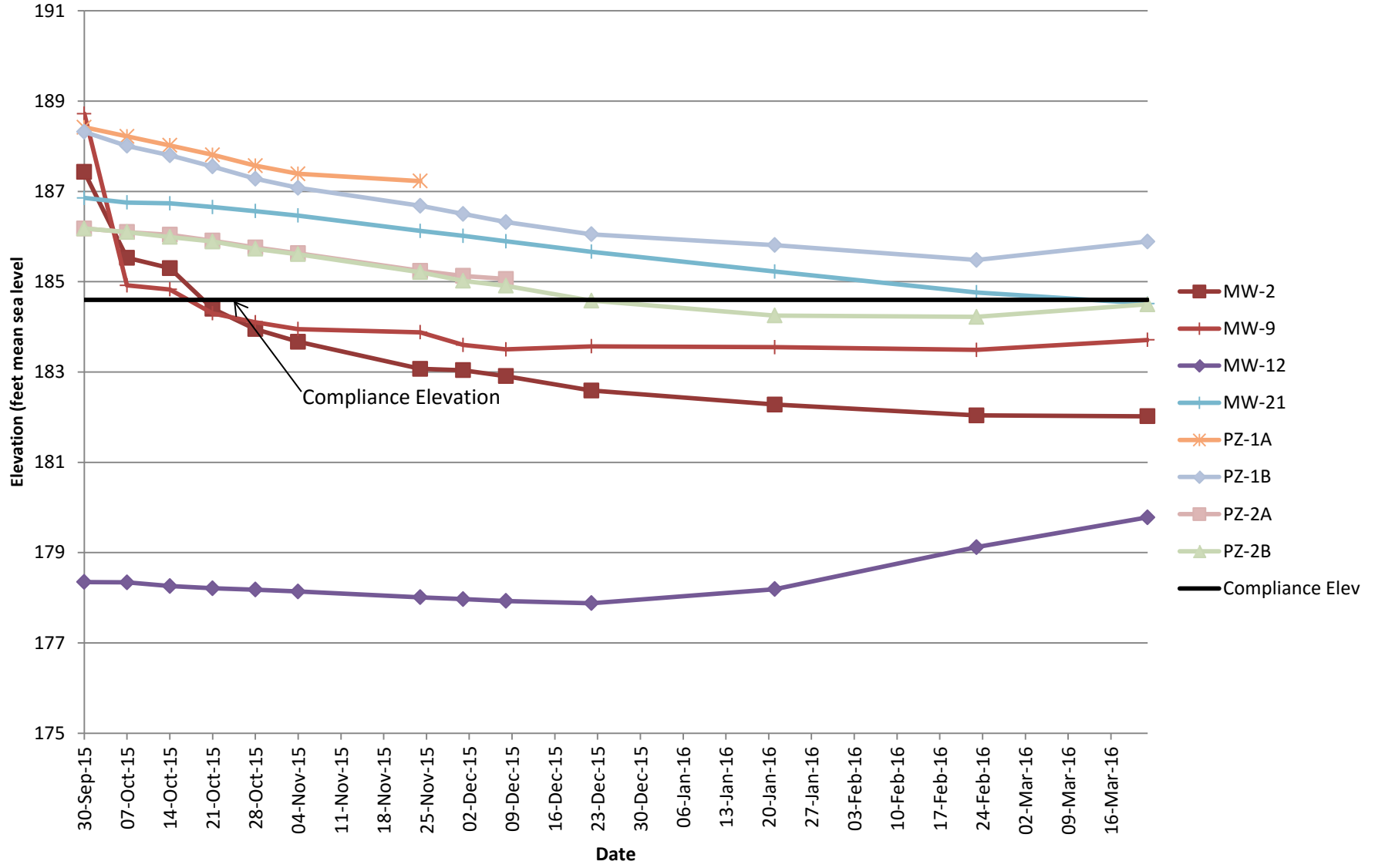


Table 1. Sump Operational Data
Closed Lincoln Landfill
1120 Virginiatown Road, Lincoln, California

Sump Structure	Date	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet TOC)	Groundwater Elevation (feet msl)	No. of Pump Starts	Operating Hours	Energy Consumption (Kw-hr)	Cummulative Discharge (gallons)	Discharge Since Previous (gallons)	Average Flow Rate (gpd)
SS1	30-Sep-15	208.34	38.75	28.75 - 38.75	19.42	188.92	--	--	--	0		
	07-Oct-15				29.18	179.16	195	20	16	21,219	21,219	3031
	14-Oct-15				29.55	178.79	218	22	16	28,688	7,469	1067
	21-Oct-15				29.71	178.63	324	30	24	39,342	10,654	1522
	28-Oct-15				29.82	178.52	422	38	30	49,220	9,878	1411
	04-Nov-15				29.88	178.46	515	46	34	58,505	9,285	1326
	24-Nov-15	208.41	38.8	28.8 - 38.8	30.27	178.14	667	46	62	77,885	19,380	969
	01-Dec-15				30.10	178.31	750	50	68	86,508	8,623	1232
	08-Dec-15				30.10	178.31	828	56	74	94,630	8,122	1160
	22-Dec-15				29.38	179.03	969	86	64	109,349	14,719	1051
	21-Jan-16				29.34	179.07	1271	112	80	140,990	31,641	1055
	23-Feb-16				29.30	179.11	1614	140	100	176,754	35,764	1084
	22-Mar-16				31.16	177.25	1911	166	118	207,801	31,047	1109
SS2	30-Sep-15	214.83	42	32 - 42	27.4	187.43	--	--	--	0		
	07-Oct-15				33.34	181.49	324	0	36	39,793	39,793	5685
	14-Oct-15				35.36	179.47	380	44	40	54,209	14,416	2059
	21-Oct-15				35.52	179.31	659	58	68	78,639	24,430	3490
	28-Oct-15				35.54	179.29	875	86	72	97,982	19,343	2763
	04-Nov-15				35.55	179.28	1072	102	86	115,560	17,578	2511
	24-Nov-15	214.89	48	38 - 48	39.93	174.96	1155	346	220	323,962	NC	NC
	01-Dec-15				36.09	178.80	1345	362	230	336,125	12,163	1738
	08-Dec-15				36.14	178.75	1570	380	240	350,540	14,415	2059
	22-Dec-15				36.53	178.36	2014	420	262	380,209	29,669	2119
	21-Jan-16				36.53	178.36	2921	496	306	438,761	58,552	1952
	23-Feb-16				36.48	178.41	3875	574	352	500,065	61,304	1858
	22-Mar-16				36.56	178.33	4666	692	390	551,293	51,228	1830
SS3	30-Sep-15	201.65	28.65	28.65 - 18.65	25.35	176.3	--	--	--	0		
	07-Oct-15				25.34	176.31	28	0	0	173	173	25
	14-Oct-15				25.41	176.24	28	0	0	392	219	31
	21-Oct-15				25.44	176.21	28	0	0	392	0	0
	28-Oct-15				25.52	176.13	28	0	0	392	0	0
	04-Nov-15				25.48	176.17	28	0	0	392	0	0
	24-Nov-15	201.67	34.5	24.5 - 34.5	31.05	170.62	630	12	2	3,435	3,043	152
	01-Dec-15				25.63	176.04	632	12	2	3,446	11	2
	08-Dec-15				25.60	176.07	632	12	2	3,446	0	0
	22-Dec-15				25.56	176.11	634	12	2	3,446	0	0
	21-Jan-16				25.04	176.63	634	12	2	3,446	0	0
	23-Feb-16				24.02	177.65	634	12	2	3,446	0	0
	22-Mar-16				23.03	178.64	634	12	2	3,446	0	0

Sump Structure	Date	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet TOC)	Groundwater Elevation (feet msl)	No. of Pump Starts	Operating Hours	Energy Consumption (Kw-hr)	Cummulative Discharge (gallons)	Discharge Since Previous (gallons)	Average Flow Rate (gpd)
SS4	30-Sep-15	195.14	19.2	19.2 - 9.2	12.39	182.75	--	--	--	0		
	07-Oct-15				12.41	182.73	--	--	--	153	153	22
	14-Oct-15				13.05	182.09	--	--	--	*	*	*
	21-Oct-15				17.20	177.94	1292	14	10	9,037	8,884	635
	28-Oct-15				16.60	178.54	1367	20	14	14,966	5,929	424
**	04-Nov-15	194.99	27.6	17.6 - 27.6	16.58	178.56	1433	26	18	20,322	5,356	383
	24-Nov-15				21.54	173.45	2307	142	64	92,217	NC	NC
	01-Dec-15				16.48	178.51	2366	146	66	95,630	3,413	488
	08-Dec-15				16.67	178.32	2432	152	70	99,524	3,894	556
	22-Dec-15				16.36	178.63	2554	162	76	106,913	7,389	528
	21-Jan-16				16.36	178.63	2926	194	94	128,820	21,907	730
	23-Feb-16				15.72	179.27	3418	236	118	157,987	29,167	884
	22-Mar-16				14.40	180.59	3864	278	140	186,817	28,830	1,030

bgs = below ground surface

gpd = gallons per day

Kw-hr = kilowatt-hours

msl = mean seal level

TOC = top of casing

-- = data not collected

* = sump under repair

** = First data collected after completing the sump repairs. Weekly flow rates not calculated because total gallons are not reflective of actual discharge to sanitary sewer.

Total Gallons Discharged	669,060
---------------------------------	----------------

Table 2. Groundwater Elevation Data

Closed Lincoln Landfill

1120 Virginiatown Road, Lincoln, California

Monitoring Well	Measurement Date	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet TOC)	Groundwater Elevation (feet msl)
MW-1	30-Sep-15	197.68	35	10-35	18.66	179.02
	07-Oct-15				18.70	178.98
	14-Oct-15				18.77	178.91
	21-Oct-15				19.07	178.61
	28-Oct-15				19.35	178.33
	04-Nov-15				19.56	178.12
	24-Nov-15				19.89	177.79
	01-Dec-15				20.02	177.66
	08-Dec-15				20.10	177.58
	22-Dec-15				20.09	177.59
	21-Jan-16				16.75	180.93
	23-Feb-16				16.27	181.41
	22-Mar-16				15.13	182.55
MW-2	30-Sep-15	215.19	45	20-45	27.76	187.43
	07-Oct-15				29.66	185.53
	14-Oct-15				29.89	185.30
	21-Oct-15				30.79	184.40
	28-Oct-15				31.24	183.95
	04-Nov-15				31.52	183.67
	24-Nov-15				32.12	183.07
	01-Dec-15				32.15	183.04
	08-Dec-15				32.28	182.91
	22-Dec-15				32.60	182.59
	21-Jan-16				32.91	182.28
	23-Feb-16				33.15	182.04
	22-Mar-16				33.17	182.02
MW-4	30-Sep-15	197.93	35	10-35	22.19	175.74
	07-Oct-15				22.23	175.70
	14-Oct-15				22.32	175.61
	21-Oct-15				22.35	175.58
	28-Oct-15				22.42	175.51
	04-Nov-15				22.46	175.47
	24-Nov-15				22.50	175.43
	01-Dec-15				22.52	175.41
	08-Dec-15				22.52	175.41
	22-Dec-15				22.49	175.44
	21-Jan-16				20.63	177.30
	23-Feb-16				19.01	178.92
	22-Mar-16				17.46	180.47

Table 2. Groundwater Elevation Data

Closed Lincoln Landfill

1120 Virginiatown Road, Lincoln, California

Monitoring Well	Measurement Date	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet TOC)	Groundwater Elevation (feet msl)
MW-5	30-Sep-15	197.73	44	38-44	19.24	178.49
	07-Oct-15				19.28	178.45
	14-Oct-15				19.35	178.38
	21-Oct-15				19.75	177.98
	28-Oct-15				20.17	177.56
	04-Nov-15				20.39	177.34
	24-Nov-15				20.73	177.00
	01-Dec-15				20.83	176.90
	08-Dec-15				20.90	176.83
	22-Dec-15				20.89	176.84
	21-Jan-16				17.15	180.58
	23-Feb-16				16.48	181.25
	22-Mar-16				15.34	182.39
MW-6	30-Sep-15	214.91	35	10-35	27.42	187.49
	07-Oct-15				27.61	187.30
	14-Oct-15				27.74	187.17
	21-Oct-15				27.93	186.98
	28-Oct-15				28.12	186.79
	04-Nov-15				28.22	186.69
	24-Nov-15				28.54	186.37
	01-Dec-15				28.64	186.27
	08-Dec-15				28.74	186.17
	22-Dec-15				28.92	185.99
	21-Jan-16				29.13	185.78
	23-Feb-16				28.82	186.09
	22-Mar-16				28.60	186.31
MW-7	30-Sep-15	181.77	24	4-24	10.97	170.80
	07-Oct-15				10.86	170.91
	14-Oct-15				11.00	170.77
	21-Oct-15				10.65	171.12
	28-Oct-15				10.58	171.19
	04-Nov-15				10.33	171.44
	24-Nov-15				9.88	171.89
	01-Dec-15				9.81	171.96
	08-Dec-15				9.69	172.08
	22-Dec-15				8.62	173.15
	21-Jan-16				2.58	179.19
	23-Feb-16				4.48	177.29
	22-Mar-16				1.89	179.88

Table 2. Groundwater Elevation Data

Closed Lincoln Landfill

1120 Virginiatown Road, Lincoln, California

Monitoring Well	Measurement Date	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet TOC)	Groundwater Elevation (feet msl)
MW-8	30-Sep-15	211.24	35	10-35	22.58	188.66
	07-Oct-15				22.73	188.51
	14-Oct-15				22.93	188.31
	21-Oct-15				23.12	188.12
	28-Oct-15				23.35	187.89
	04-Nov-15				23.53	187.71
	24-Nov-15				23.97	187.27
	01-Dec-15				24.13	187.11
	08-Dec-15				24.29	186.95
	22-Dec-15				24.58	186.66
	21-Jan-16				24.82	186.42
	23-Feb-16				25.09	186.15
	22-Mar-16				24.69	186.55
MW-9	30-Sep-15	211.32	35	10-35	22.60	188.72
	07-Oct-15				26.40	184.92
	14-Oct-15				26.49	184.83
	21-Oct-15				27.02	184.30
	28-Oct-15				27.22	184.10
	04-Nov-15				27.37	183.95
	24-Nov-15				27.44	183.88
	01-Dec-15				27.72	183.60
	08-Dec-15				27.82	183.50
	22-Dec-15				27.75	183.57
	21-Jan-16				27.77	183.55
	23-Feb-16				27.83	183.49
	22-Mar-16				27.61	183.71
MW-11	30-Sep-15	198.97	35	10-35	17.03	181.94
	07-Oct-15				17.05	181.92
	14-Oct-15				17.22	181.75
	21-Oct-15				17.74	181.23
	28-Oct-15				17.91	181.06
	04-Nov-15				18.04	180.93
	24-Nov-15				18.42	180.55
	01-Dec-15				18.38	180.59
	08-Dec-15				18.51	180.46
	22-Dec-15				18.46	180.51
	21-Jan-16				16.95	182.02
	23-Feb-16				16.46	182.51
	22-Mar-16				15.33	183.64

Table 2. Groundwater Elevation Data

Closed Lincoln Landfill

1120 Virginiatown Road, Lincoln, California

Monitoring Well	Measurement Date	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet TOC)	Groundwater Elevation (feet msl)
MW-12	22-Mar-16	209.79	35	10-35	15.33	183.64
	30-Sep-15				31.44	178.35
	07-Oct-15				31.45	178.34
	14-Oct-15				31.53	178.26
	21-Oct-15				31.58	178.21
	28-Oct-15				31.61	178.18
	04-Nov-15				31.65	178.14
	24-Nov-15				31.78	178.01
	01-Dec-15				31.82	177.97
	08-Dec-15				31.86	177.93
	22-Dec-15				31.91	177.88
	21-Jan-16				31.60	178.19
	23-Feb-16				30.67	179.12
	22-Mar-16				30.01	179.78
MW-15	30-Sep-15	204.60	35	10-35	28.58	176.02
	07-Oct-15				28.63	175.97
	14-Oct-15				28.68	175.92
	21-Oct-15				28.70	175.90
	28-Oct-15				28.72	175.88
	04-Nov-15				28.73	175.87
	24-Nov-15				28.78	175.82
	01-Dec-15				28.75	175.85
	08-Dec-15				28.73	175.87
	22-Dec-15				28.68	175.92
	21-Jan-16				28.29	176.31
	23-Feb-16				27.14	177.46
	22-Mar-16				26.28	178.32
MW-16	30-Sep-15	199.82	35	10-35	26.52	173.30
	07-Oct-15				26.41	173.41
	14-Oct-15				26.50	173.32
	21-Oct-15				26.31	173.51
	28-Oct-15				26.24	173.58
	04-Nov-15				26.05	173.77
	24-Nov-15				25.79	174.03
	01-Dec-15				25.71	174.11
	08-Dec-15				25.62	174.20
	22-Dec-15				25.37	174.45
	21-Jan-16				24.29	175.53
	23-Feb-16				24.31	175.51
	22-Mar-16				21.64	178.18

Table 2. Groundwater Elevation Data

Closed Lincoln Landfill

1120 Virginiatown Road, Lincoln, California

Monitoring Well	Measurement Date	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet TOC)	Groundwater Elevation (feet msl)
MW-17	30-Sep-15	181.26	25	5-25	8.51	172.75
	07-Oct-15				8.53	172.73
	14-Oct-15				8.84	172.42
	21-Oct-15				8.58	172.68
	28-Oct-15				8.17	173.09
	04-Nov-15				7.93	173.33
	24-Nov-15				8.12	173.14
	01-Dec-15				8.02	173.24
	08-Dec-15				8.02	173.24
	22-Dec-15				6.93	174.33
	21-Jan-16				7.32	173.94
	23-Feb-16				7.82	173.44
	22-Mar-16				6.92	174.34
MW-18	30-Sep-15	191.67	35	10-35	19.15	172.52
	07-Oct-15				19.31	172.36
	14-Oct-15				19.30	172.37
	21-Oct-15				19.34	172.33
	28-Oct-15				19.41	172.26
	04-Nov-15				19.44	172.23
	24-Nov-15				19.27	172.40
	01-Dec-15				19.31	172.36
	08-Dec-15				19.21	172.46
	22-Dec-15				18.45	173.22
	21-Jan-16				14.93	176.74
	23-Feb-16				12.48	179.19
	22-Mar-16				8.70	182.97
MW-19	30-Sep-15	202.16	35	10-35	17.76	184.40
	07-Oct-15				17.82	184.34
	14-Oct-15				17.87	184.29
	21-Oct-15				17.92	184.24
	28-Oct-15				18.00	184.16
	04-Nov-15				18.10	184.06
	24-Nov-15				18.36	183.80
	01-Dec-15				18.44	183.72
	08-Dec-15				18.53	183.63
	22-Dec-15				18.72	183.44
	21-Jan-16				17.94	184.22
	23-Feb-16				17.19	184.97
	22-Mar-16				16.16	186.00

Table 2. Groundwater Elevation Data

Closed Lincoln Landfill

1120 Virginiatown Road, Lincoln, California

Monitoring Well	Measurement Date	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet TOC)	Groundwater Elevation (feet msl)
MW-20	30-Sep-15	206.95	35	10-35	17.23	189.72
	07-Oct-15				17.77	189.18
	14-Oct-15				17.98	188.97
	21-Oct-15				18.29	188.66
	28-Oct-15				18.53	188.42
	04-Nov-15				18.68	188.27
	24-Nov-15				18.89	188.06
	01-Dec-15				19.03	187.92
	08-Dec-15				19.15	187.80
	22-Dec-15				19.25	187.70
	21-Jan-16				19.22	187.73
	23-Feb-16				19.29	187.66
	22-Mar-16				18.84	188.11
MW-21	30-Sep-15	216.66	40	30-40	29.81	186.85
	07-Oct-15				29.91	186.75
	14-Oct-15				29.93	186.73
	21-Oct-15				30.01	186.65
	28-Oct-15				30.10	186.56
	04-Nov-15				30.20	186.46
	24-Nov-15				30.54	186.12
	01-Dec-15				30.65	186.01
	08-Dec-15				30.77	185.89
	22-Dec-15				31.00	185.66
	21-Jan-16				31.44	185.22
	23-Feb-16				31.90	184.76
	22-Mar-16				32.15	184.51
PZ-1A	30-Sep-15	215.61	26	21-26	27.19	188.42
	07-Oct-15				27.39	188.22
	14-Oct-15				27.59	188.02
	21-Oct-15				27.80	187.81
	28-Oct-15				28.04	187.57
	04-Nov-15				28.22	187.39
	24-Nov-15				28.38	187.23
	01-Dec-15				dry	--
	08-Dec-15				dry	--
	22-Dec-15				dry	--
	21-Jan-16				dry	--
	23-Feb-16				dry	--
	22-Mar-16				dry	--

Table 2. Groundwater Elevation Data

Closed Lincoln Landfill

1120 Virginiatown Road, Lincoln, California

Monitoring Well	Measurement Date	Top of Casing Elevation (feet msl)	Total Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Groundwater (feet TOC)	Groundwater Elevation (feet msl)
PZ-1B	30-Sep-15	215.70	40	35-40	27.38	188.32
	07-Oct-15				27.69	188.01
	14-Oct-15				27.90	187.80
	21-Oct-15				28.15	187.55
	28-Oct-15				28.42	187.28
	04-Nov-15				28.62	187.08
	24-Nov-15				29.02	186.68
	01-Dec-15				29.20	186.50
	08-Dec-15				29.38	186.32
	22-Dec-15				29.65	186.05
	21-Jan-16				29.89	185.81
	23-Feb-16				30.22	185.48
	22-Mar-16				29.81	185.89
PZ-2A	30-Sep-15	211.77	29	21-26	25.59	186.18
	07-Oct-15				25.67	186.10
	14-Oct-15				25.73	186.04
	21-Oct-15				25.86	185.91
	28-Oct-15				26.01	185.76
	04-Nov-15				26.14	185.63
	24-Nov-15				26.53	185.24
	01-Dec-15				26.64	185.13
	08-Dec-15				26.71	185.06
	22-Dec-15				dry	--
	21-Jan-16				dry	--
	23-Feb-16				dry	--
	22-Mar-16				dry	--
PZ-2B	30-Sep-15	211.76	29	35-40	25.58	186.18
	07-Oct-15				25.66	186.10
	14-Oct-15				25.77	185.99
	21-Oct-15				25.87	185.89
	28-Oct-15				26.03	185.73
	04-Nov-15				26.15	185.61
	24-Nov-15				26.55	185.21
	01-Dec-15				26.74	185.02
	08-Dec-15				26.85	184.91
	22-Dec-15				27.18	184.58
	21-Jan-16				27.51	184.25
	23-Feb-16				27.54	184.22
	22-Mar-16				27.26	184.50

bgs = below ground surface

msl = mean sea level

TOC = top of casing

Table 3. Groundwater Analytical Results

Closed Lincoln Landfill

1120 Virginiatown Road, Lincoln, California

Sample ID	Total Dissolved Solids (mg/L)					Flow Weighted Average TDS (mg/L)
	MD	SS1	SS2	SS3	SS4	
30-Sep-15	NS	423	444	NS	NS	NC
07-Oct-15	NS	349	344	992	1,430	350
24-Nov-15	NS	280	332	NS	NS	310
22-Dec-15	NS	274	328	NS	1,220	439
21-Jan-16	NS	296	320	NS	1,000	446
23-Feb-16	NS	290	322	NS	1,170	509
22-Mar-16	NS	309	319	NS	1,150	532

Total dissolved solids analyzed using SM 2540C

mg/L = milligrams per liter

MD = manifold discharge

NS = not sampled

NC = not calculated



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3860 Morrow Lane, Suite F
Chico, California 95928

voice 530.894.8966
fax 530.894.5143

March 03, 2016

Lab ID: 16B1006

HEIDI CUMMINGS
HOLDREGE & KULL
8 SEVILLE COURT, SUITE 100
CHICO, CA 95928

RE: CLOSED LINCOLN LANDFILL 70472-02PW

Dear HEIDI CUMMINGS ,

Enclosed are the analysis results for Work Order number 16B1006. All analysis were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

For

Ricky D. Jensen
Laboratory Director

California ELAP Certification Number 1677



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basic
laboratory

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Redding, California 96001

voice 530.243.7234
fax 530.243.7494

3860 Morrow Lane, Suite F
Chico, California 95928

voice 530.894.8966
fax 530.894.5143

Report To: HOLDREGE & KULL
8 SEVILLE COURT, SUITE 100
CHICO, CA 95928

Attention: HEIDI CUMMINGS

Project: CLOSED LINCOLN LANDFILL 70472-02PW

Lab No: 16B1006
Reported: 03/03/16
Phone: (530) 894-2487
P.O. #

General Chemistry (ELAP #2718)

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
SS1 Water (16B1006-01)		Sampled:02/23/16 10:35	Received:02/24/16 09:25	Temp (C): 1.3					
Total Dissolved Solids	mg/l	290		3	6	SM 2540C	02/26/16	02/26/16	B6B1446
SS2 Water (16B1006-02)		Sampled:02/23/16 10:50	Received:02/24/16 09:25	Temp (C): 2.1					
Total Dissolved Solids	mg/l	332		3	6	SM 2540C	02/26/16	02/26/16	B6B1446
SS4 Water (16B1006-03)		Sampled:02/23/16 12:20	Received:02/24/16 09:25	Temp (C): 1.5					
Total Dissolved Solids	mg/l	1170		3	6	SM 2540C	02/26/16	02/26/16	B6B1446

Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

General Chemistry (ELAP #2718)

Batch B6B1446 - General Prep - Chico Gen Chem

Blank

Total Dissolved Solids ND 6 mg/l

LCS

Total Dissolved Solids 208 mg/l 200 104 80-120

Duplicate Source: 16B0902-01

Total Dissolved Solids 90 6 mg/l 91 1.10 5

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the detection limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
<	Less than reporting limit
≤	Less than or equal to reporting limit
>	Greater than reporting limit
≥	Greater than or equal to reporting limit
MDL	Method Detection Limit
RL/ML	Minimum Level of Quantitation
MCL/AL	Maximum Contaminant Level/Action Level
mg/kg	Results reported as wet weight
TTLC	Total Threshold Limit Concentration
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leachate Procedure

- Note 1 Received Temperature - according to EPA guidelines, samples for most chemistry methods should be held at ≤6 degrees C after collection, including during transportation, unless the time from sampling to delivery is <2 hours. Regulating agencies may invalidate results if temperature requirements are not met.
- Note 2 According to 40 CFR Part 136 Table II, the following tests should be analyzed in the field within 15 minutes of sampling: pH, chlorine, dissolved oxygen, and sulfite.

Approved By

Basic Laboratory, Inc.

California ELAP Cert #1677 and #2718

504

3860 Morrow Lane, Suite F, Chico, CA 95928 (530) 894-8966 FAX (530) 894-5143

16B1004

OF SAMPLES:

3

GW

Yes No N/A

EDD TYPE:

QC: Standard Level II

LAB ID	CHLORINE RESIDUAL OR COMMENTS
--------	-------------------------------------

Holdrege & Kull

8 Seville Ct
Suite 100
Chico, CA 9

Heidi Cummings

530-694-2487

hummingsehandk.net

530-894-2437

RESULTS SENT: (Email) Fax EDD Mail

SAME

PO#:

[illegible]

NUMBER OF BOTTLES

TDS by SP42540C

ANALYSIS REQUESTED

70472-02PW

Closed Lincoln LF

3/9/16

Standard **Rush**

OF SAMPLES:

MATRIX / TYPE:

CUSTODY SEAL INTACT?

SYSTEM #:

EDD TYPE:

QC: Standard Level II

LAB ID	CHLORINE RESIDUAL OR COMMENTS
--------	-------------------------------------

PRESERVED WITH: HNO₃ H₂SO₄ NaOH ZnAce/NaOH HCL NaThio OTHER NONE

AMPLIFIED BY (PRINT):
Kirk Koester

2/25/16

RELINQUISHED BY:
Kirk Kaest

2/24/16

RECEIVED BY (LAB):

meacha leanta

2/24/14 @ 925

MT

2/24/14 @ 930

MI

2/24/14 933

CARRIER: _____ COOLER TEMPERATURE: _____ °C

SAMPLE TYPE: 1 = ROUTINE, 2 = REPEAT, 3 = REPLACEMENT, 4 = SPECIAL, 5 = RAW



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fax 530.243.7494

3860 Morrow Lane, Suite F
Chico, California 95928

voice 530.894.8966
fax 530.894.5143

March 31, 2016

Lab ID: 16C1003

HEIDI CUMMINGS
HOLDREGE & KULL

8 SEVILLE COURT, SUITE 100
CHICO, CA 95928

RE: CLOSED LINCOLN LANDFILL 70472-02PW-S

Dear HEIDI CUMMINGS ,

Enclosed are the analysis results for Work Order number 16C1003. All analysis were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

For

A handwritten signature in cursive script that reads "Ricky D. Jensen".

Ricky D. Jensen
Laboratory Director

California ELAP Certification Number 1677



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3860 Morrow Lane, Suite F
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voice 530.894.8966
fax 530.894.5143

Report To: HOLDREGE & KULL
8 SEVILLE COURT, SUITE 100
CHICO, CA 95928

Attention: HEIDI CUMMINGS

Project: CLOSED LINCOLN LANDFILL 70472-02PW-S

Lab No: 16C1003
Reported: 03/31/16
Phone: (530) 894-2487
P.O. #

General Chemistry (ELAP #2718)

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
SS1 Water (16C1003-01)		Sampled:03/22/16 11:45	Received:03/23/16 16:58	Temp (C): 12.2					
Total Dissolved Solids	mg/l	309		3	6	SM 2540C	03/28/16	03/28/16	B6C1605
SS2 Water (16C1003-02)		Sampled:03/22/16 14:44	Received:03/23/16 16:58	Temp (C): 10.6					
Total Dissolved Solids	mg/l	319		3	6	SM 2540C	03/28/16	03/28/16	B6C1605
SS4 Water (16C1003-03)		Sampled:03/22/16 13:30	Received:03/23/16 16:58	Temp (C): 9.9					
Total Dissolved Solids	mg/l	1150		3	6	SM 2540C	03/28/16	03/28/16	B6C1605

Quality Control Data

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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General Chemistry (ELAP #2718)

Batch B6C1605 - General Prep - Chico Gen Chem

Blank

Total Dissolved Solids ND 6 mg/l

LCS

Total Dissolved Solids 194 mg/l 200 97.0 80-120

Duplicate Source: 16C0931-01

Total Dissolved Solids 207 6 mg/l 199 3.94 5

Duplicate Source: 16C1003-02

Total Dissolved Solids 321 6 mg/l 319 0.625 5

Approved By

Basic Laboratory, Inc.

California ELAP Cert #1677 and #2718

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Report To: HOLDREGE & KULL
8 SEVILLE COURT, SUITE 100
CHICO, CA 95928

Attention: HEIDI CUMMINGS

Project: CLOSED LINCOLN LANDFILL 70472-02PW-S

Lab No: 16C1003
Reported: 03/31/16
Phone: (530) 894-2487
P.O. #

Notes and Definitions

DET	Analyte DETECTED
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>	Greater than reporting limit
≥	Greater than or equal to reporting limit
MDL	Method Detection Limit
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MCL/AL	Maximum Contaminant Level/Action Level
mg/kg	Results reported as wet weight
TTLC	Total Threshold Limit Concentration
STLC	Soluble Threshold Limit Concentration
TCLP	Toxicity Characteristic Leachate Procedure

- Note 1 Received Temperature - according to EPA guidelines, samples for most chemistry methods should be held at ≤ 6 degrees C after collection, including during transportation, unless the time from sampling to delivery is < 2 hours. Regulating agencies may invalidate results if temperature requirements are not met.
- Note 2 According to 40 CFR Part 136 Table II, the following tests should be analyzed in the field within 15 minutes of sampling: pH, chlorine, dissolved oxygen, and sulfite.

Approved By

Basic Laboratory, Inc.

California ELAP Cert #1677 and #2718

508

HK HOLDREGE & KULL

CONSULTING ENGINEERS • GEOLOGISTS



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Corporate Headquarters
792 Searls Avenue
Nevada City, CA 95959
530-478-1305

Truckee

10775 Pioneer Trail, Suite 213
Truckee, CA 96161
530-587-5156

Chico

48 Bellarmine Court, Suite 40
Chico, CA 95928
530-894-2487

Yuba City

1282 Stabler Lane, Suite 630-300
Yuba City, CA 95993
530-794-1003

Fresno

8050 North Palm, Suite 300
Fresno, CA 93711
559-389-5854

Murphys

940 Algiers Street
Murphys, CA 95247
530-362-2775

CITY OF LINCOLN
Attn: Ray Leftwich, P.E., City Engineer
600 Sixth Street
Lincoln, CA 95648

May 27, 2016

Subject: ***Request for Proposals to Provide Engineering Services on the Closed Lincoln Landfill Monitoring Project***

Dear Mr. Leftwich:

Applied Engineering and Geology, Inc. (AEG) is pleased to submit this Proposal in response to your **Request for Proposals to Provide Engineering Services on the Closed Lincoln Landfill Monitoring Project and Addendum No. 1**. AEG would like to express our interest in partnering with the City of Lincoln Engineering Department (City) on this project.

Just 1.8 miles southwest of the Closed Lincoln Landfill resides AEG's office in Lincoln, Placer County, CA. AEG is a professional Environmental Engineering firm that has been serving California and parts of Nevada since 1990. We are a State of California Certified Small Business (No. 6417) and have provided a wide variety of environmental services for the City of Lincoln, as well as throughout Placer County for Federal, State, Tribal and local agencies. All members of AEG take great pride in providing each and every one of our clients with superior service and a proactive approach to resolving all project objectives.

AEG's portfolio is comprised of landfill projects dating back to 1992, where we began with conducting groundwater monitoring and reporting for the Closed Lincoln Landfill. AEG conducted monitoring, reporting, and maintenance of the Closed Lincoln Landfill between 1992 and 2013, and has assisted the City with technical review on the project through 2015. Our landfill experience includes negotiating Waste Discharge Requirement (WDRs) provisions and language; groundwater sampling, reporting, and statistical analysis; as well as, maintaining, investigating, and remediating municipal landfills. AEG also has years of experience with developing and implementing corrective action plans (CAPs), preparing engineering feasibility studies (EFSs) for groundwater corrective action and monitoring programs, preparing Storm Water Pollution Prevention Plans (SWPPPs), performing storm water monitoring, and preparing annual storm water reports.

AEG understands that the City has solicited proposals from qualified firms to perform 1) Winterization Inspection and Reporting; 2) Semi-Annual Monitoring and Reporting; 3) Five Year Constituents of Concern Monitoring and Reporting; 4) Annual Maintenance; 5) Storm Water Monitoring and Reporting; and, 6) Corrective Action Workplan Monitoring for the Closed Lincoln Landfill. With over 26 years of experience working on municipal and agricultural landfills with WDRs Orders, AEG is a well qualified candidate to assist the City with all water quality monitoring and reporting activities at Closed Lincoln Landfill.

AEG looks forward to the opportunity of working with the City on this project. If you have any questions regarding the content of this Proposal, please contact the undersigned at 916.645.6014 or by Email at earl@aegEngineers.com.

Sincerely,



Earl Stephens, PE, QSD/QSP
Principal Engineer
APPLIED ENGINEERING AND GEOLOGY, INC.

RESPONSE TO REQUEST FOR PROPOSALS TO PROVIDE ENGINEERING SERVICES ON THE CLOSED LINCOLN LANDFILL MONITORING PROJECT

Consultant Identification

Applied Engineering and Geology, Inc. (AEG)

Mailing Address:
P.O. Box 247
Lincoln, California 95648

Office Address:
578 E Street
Lincoln, California 95648

Office Phone: 916.645.6014

Earl Stephens, PE, QSD/QSP (Principal Engineer)

Email: earl@aengineers.com

Dane Frank, PE (Project Manager)

Email: dane@aengineers.com

Qualifications

AEG worked on the Closed Lincoln Landfill from 1992 through 2015 and we are very familiar with the Site and its associated WDRs Order No. R5-2003-0142. Our work on the Lincoln Landfill includes, but is not limited to:

- Groundwater monitoring, reporting, and analysis in accordance with WDRs No. R5-2003-0142.
- Storm water monitoring, sampling, monthly observations, and maintenance in accordance with WDRs and the Industrial General Permit.
- Facility monitoring and maintenance, including mowing, site repairs, and well pump replacement.
- Corrective Action Plan (CAP) development, implementation, and reporting.
- Preparation of an Engineering Feasibility Study.
- Statistical analysis of monitoring wells in comparison to background wells.
- Compile, tabulate, graph, and evaluate groundwater and soil gas data per regulatory standards.
- Defined extent of contamination plume.
- Assisted with offsite access agreements/easements and conducted monitoring well installations.
- Performed technical peer review of 2nd CAP design.

The Benefits of Working with AEG

AEG has been assisting the City of Lincoln with this project for over two decades, we have a thorough understanding of the tasks required to achieve overall success of this project. We are a local, City of Lincoln Business, located diagonally across from City Hall and minutes from the Closed Lincoln Landfill. Our location makes storm water inspections and groundwater monitoring events easy to schedule and saves money on transportation costs. Additionally, our location makes us extremely available to the City for meetings on the project.

Project Understanding and Approach

Scope of Services

AEG understands that the Project is comprised of the following tasks:

- Winterization Inspection and Reporting;
- Semi-Annual Monitoring and Reporting (3 Years, Second Half 2016 through First Half 2019);
- Five Year Constituents of Concern (COCs) Monitoring and Reporting;
- Annual Maintenance;
- Storm Water Monitoring; and,
- Corrective Action Workplan Monitoring.

A detailed discussion of each of these tasks and subtasks is as follows:

Winterization Report

AEG will complete three winterization inspections and reports. One winterization inspection and report will be complete for each fiscal year of this contract (2016-2019).

AEG will travel to the Site prior to the raining seasons, and before September 30, to perform a winterization inspection. All Site inspections and reporting will be in compliance with California Regional Water Quality Control Board's (Regional Board's) Order Number R5-2003-0142 (WDRs). During the Site inspection, AEG will identify any damage to the landfill cover, grade, precipitation and drainage controls, access roads, and other onsite facilities. Any damages or repairs which are needed will be brought to the City's attention immediately. If any major repairs are needed, AEG will gladly make the necessary repairs if authorized by the City as additionally assigned work.

Following the winterization inspection, AEG will prepare a report that documents all winterization activities.

Semi-Annual Monitoring and Reporting

AEG will conduct a total of six Semi-Annual Monitoring and Reporting events. These events will take place during the Second Half 2016 through First Half 2019. Semi-Annual Monitoring and Reporting will consist of the following:

Quarterly Depth-to-Water Measurements: On a quarterly basis, AEG will collect depth-to-water measurements from all 17 monitoring wells. Depth-to-water data will be used to calculate groundwater elevations by subtracting the depth to groundwater in each of the wells from the surveyed elevation of the top of the casing. Groundwater elevations of the monitoring well network will be used to determine the direction for groundwater flow, gradient, and groundwater flow velocity. Groundwater elevations will be used to prepare hydrographs that depict the highest and lowest groundwater elevation in each well relative to the top and bottom of the well screen. The groundwater elevations will also be compared to the elevation required by the Cleanup and Abatement Order No. R5-2014-0703 (184.6 feet msl) for maintaining a minimum of five feet of separation between the bottom of the waste material and top of the groundwater surface.

Semi-Annual Groundwater Monitoring: AEG will perform groundwater monitoring on a semi-annual basis as required by the WDRs. Semi-Annual Groundwater Monitoring will consist of sampling all 17 on and offsite monitoring wells. Prior to groundwater sampling, AEG will conduct a Site visit to check, repair, and replace (if authorized) all dedicated well pumps.

Project Understanding and Approach

Groundwater monitoring will consist of purging each monitoring well of at least three well volumes or until dry. The temperature, pH, electrical conductivity, and turbidity of the purge water will be measured and recorded. Groundwater samples will be collected from the dedicated well pumps in each well and placed in appropriate containers with appropriate preservatives as provided by the laboratory. The samples will then be labeled, stored in a chilled ice chest, and transported under strict chain-of-custody to a State of California certified analytical laboratory for analysis. All groundwater samples collected, including a trip blank, field blank, and duplicate sample will be analyzed per the Monitoring and Reporting Program (MRP) as shown below:

- Total Dissolved Solids by Standard Method 2540C;
- Total Alkalinity (Bicarbonate/Carbonate) by Standard Method 2320B;
- Major Anions (Chloride, Nitrate, Sulfate) by EPA Method 300.0;
- Major Cations (Calcium, Magnesium, Potassium, Sodium) by EPA Method 200.7; and,
- Volatile Organic Compounds (VOCs) by EPA Method 8260.

Note, several analytical methods listed in the WDRs are out of date and have been updated. The analytical methods shown are revised or updated procedures for the desired analysis.

In addition to collecting samples from the monitoring wells, AEG will collect two surface water samples from Auburn Ravine, one upstream (AR-E) and the other downstream (AR-W) of the landfill as required by the WDRs. Note, if VOCs are not detected in samples collected from Auburn Ravine after two consecutive semi-annual sampling event, per the WDRs, AEG will request a sampling reduction to discontinue sampling for VOCs.

Semi-Annual Reporting: AEG will prepare monitoring reports in accordance with the Monitoring and Reporting Plan requirements listed in the WDRs. Semi-Annual Reporting for the Site will include the following:

- All reporting required by WDRs Order No. R5-2003-0142;
- Summary of well information, including well name, top of casing elevation, total depth, depth/elevation of screen interval, and soil type surrounding the screen interval;
- A discussion and evaluation of the monitoring results;
- Tabulated summaries of the monitoring data showing sampling dates, well constituents, concentrations, concentration limits, and units. Data will be presented in a manner that clearly shows exceedances that have occurred during the monitoring period;
- Groundwater velocity calculations;
- Groundwater data and elevation contour maps, depicting the estimated extent of the contaminant plume and direction of groundwater flow, respectively;
- Statistical analysis of analytical results including graphical summaries and narrative discussion of the corrective action monitoring;
- Compliance evaluation summary of monitoring parameters;
- Evaluation of the quality control data; and,
- All field data, including but not limited to, field data sheets, chain-of-custody forms, analytical reports, and facility inspection forms.

Project Understanding and Approach

AEG will provide the City with an electronic copy of the report (in PDF format) and a bound copy of the report (if requested). Following the City's approval, the report will be uploaded to the GeoTracker database for compliance with Assembly Bill 2886.

Annual Reporting: The Second Half Semi-Annual Monitoring Report of each year will also serve as the Annual Monitoring Report, and include the following additional items:

- Tabular and graphical summary of prior years monitoring data, including time series plots of each monitoring well parameter;
- Summary of trend analysis performed on each constituent during the prior year;
- Summary of groundwater chemistry analysis for the prior year including cation-anion balance calculations, Stiff diagrams, and Piper diagrams (Trilinear plots); and,
- Detailed discussion on contaminant plume size compared to the previous year, and increasing, decreasing, and stable constituent trends.

Semi-Annual Monitoring and Reporting of the Five Year COCs

Monitoring of the Five Year COCs: During the First Half 2019, AEG will collect samples to be analyzed for the five year COCs in addition to the standard semi-annual monitoring parameters. Five year sampling and reporting will be conducted in conjunction with the First Half 2019 Semi-Annual Sampling and Reporting Event. Based on the WDRs, all wells do not have to be sampled for the five year COCs, which results in a significant cost savings to the City. Based on language in the WDRs, Point of Compliance Wells (MW-1, MW-3 (destroyed), MW-4, and MW-5) and any future shallow wells installed along the down-gradient or side-gradient perimeter of the landfill are required to be sampled for the five year COCs. Therefore, AEG will collect groundwater samples for the five year COCs from wells MW-1, MW-4, MW-5, and MW-11, and one duplicate sample.

AEG will follow the same sampling procedure as previously discussed for Semi-Annual Groundwater Monitoring. Groundwater samples for the five year COCs will be collected in appropriate containers with appropriate preservatives as provided by the laboratory. The samples will then be labeled, stored in a chilled ice chest, and transported under strict chain-of-custody to a State of California certified analytical laboratory for analysis. Analysis of the five year COCs will be in accordance of Attachment D of the WDRs as shown below:

- Dissolved Inorganics/Metals (by various methods);
- Semi-Volatile Organic Compounds by EPA Method 8270;
- Organophosphorus Pesticides by EPA Method 8141;
- Chlorinated Herbicides by EPA Method 8151;
- Organochlorine Pesticides by EPA Method 8081; and,
- Polychlorinated Biphenols by EPA Method 8082.

Note, in addition to the five year COCs, groundwater samples will be analyzed for the standard semi-annual parameters during First Half 2019.

Reporting of the Five Year COCs: The five year COCs will be reported in the First Half 2019 Semi-Annual Monitoring Report, in addition to the standard semi-annual reporting requirements. Additional discussions will be provided on the five year COCs and will include the following:

Project Understanding and Approach

- Discussion and evaluation of the five year COCs monitoring results compared to previous reporting years;
- Tabulated summaries of the five year COCs monitoring data; and,
- Trend analysis of five year COCs compared to previous reporting years.

Annual Maintenance

As part of annual maintenance, AEG will cut fire breaks, perform mowing, and make Site repairs as necessary. A detailed explanation of the annual maintenance that AEG will perform is shown below:

Fire Break and Mowing: As required by the Placer County Division of Environmental Health (County) and the WDRs, the landfill will be mowed on an as-needed basis to minimize cover for rodents and reduce fire danger. AEG will utilize a commercial field mower to mow the majority of the landfill. The perimeter of the landfill, berms, and areas covered with cobbles will be hand trimmed. The number of mowing events is dictated by the growth of grass and weather conditions. For the purposes of this proposal, AEG estimates that the landfill will need to be mowed five times during each spring/summer season. AEG will notify the City prior to mowing activities.

Site Repairs as Required by the County: AEG will make arrangements to meet with Placer County and Regional Board representatives and perform reasonable Site repairs as requested by the City. Site repairs may consist of perimeter fence repairs, filling in of tire ruts and rodent holes, replacing signage, etc. Significant and large scale repairs are not included in this scope of work. However, if necessary and authorized by the City, AEG will perform other necessary large scale repairs within our ability.

Storm Water Monitoring and Reporting

Storm Water Monitoring and Report will be performed in accordance with WDRs at the Closed Lincoln Landfill.

Storm Water Monitoring: During the rainy season, AEG will conduct monthly site inspections following storm events to inspect for erosion of the clay cap. Additionally, AEG will conduct storm water sampling of two Qualifying Storm Events (QSEs) within the reporting year (July 1 through June 30). Two sets of surface water samples will be collected (if available) from storm water monitoring locations SW-1 and SW-2 (upstream and downstream, respectively), located along the perimeter ditch on the east side of the landfill. Storm water samples will be analyzed by Standard Method 5310C for Total Organic Carbon; and by Standard Method 2540D for Total Suspended Solids. Additionally, AEG will collect field parameters of pH and electrical conductivity.

Storm Water Reporting: Following the rainy season, AEG will prepare the annual storm water report to document storm water monitoring activities during the current fiscal year. This report will be provided to the City to distribute to the Regional Board.

Corrective Action Work Plan Monitoring

In accordance with CAO R5-2014-0703 and the Corrective Action Work Plan dated September 30, 2014, AEG will perform quarterly monitoring of the dewatering system. A detailed explanation of the Corrective Action Work Plan Monitoring that AEG will perform is shown below:

Project Understanding and Approach

Groundwater Level Measurements: In conjunction with quarterly depth to water measurements, AEG will collect groundwater elevation data from the four onsite sumps and two dual nested piezometers. Additionally, readings will be collected from each sump structure, including total flow, number of pump starts, energy consumed, and total hours of operations.

Groundwater Quality Sampling: Quarterly groundwater samples will be collected from each sump that has discharged during the quarter. Groundwater samples will be collected directly from the sump and placed in appropriate containers with appropriate preservatives as provided by the laboratory. The samples will then be labeled, stored in a chilled ice chest, and transported under strict chain-of-custody to a State of California certified analytical laboratory for analysis. Groundwater samples will be analyzed by Standard Method 2540C.

Remote Telemetry Monitoring: To verify that the pumps are operating in their predetermined ranges and there is no significant increase in water level, AEG will perform weekly remote monitoring of the dewatering system using Instrumentation Northwest's online database software.

Reporting: AEG will prepare an O&M report for each quarter to document compliance with the WDRs and CAO. Reports will include an assessment of whether the groundwater elevation meets the compliance elevation of 184.6 feet msl. Reports will include, but will not be limited to, the following information: all operational data, groundwater level data recorded at all site monitoring wells and sumps, groundwater quality data, and maintenance activities performed during the quarter. Each report will be completed in accordance with the CAO and will be approved by a California licensed Professional Engineer. Reports will be submitted to the City for review a minimum of five days prior to submittal to the RWQCB. Reports will be uploaded to GeoTracker and submitted via email to the Central Valley Water Board's Sacramento office 30 days following the completion of the quarter.

AEG's Quality Assurance/Quality Control

Quality Assurance and Quality Control (QA/QC) is one of AEG's top priorities and is overseen by Dane Frank (Project Manager), as well as other key staff members working on the project. Note: A brief bio of each key staff member and their responsibilities for the QA/QC process is included on Page 8. AEG's QA/QC process begins prior to field work by properly calibrating all field equipment to the manufacturer's specifications, and decontaminating any equipment used during the sampling process with a laboratory grade detergent (Liquinox). During field activities, the Project Manager is in charge of monitoring field staff to assure field calculations are performed correctly, equipment is properly decontaminated when moved between wells, wells are purged and sampled in the proper order, gloves are being worn and no cross contamination occurs during sampling collection, samples are properly labeled and placed on ice, and the laboratory receives the samples in good condition within the appropriate hold times.

As part of each sampling event, and resampling event (if required), Trip Blanks are obtained from the laboratory and submitted along with the other groundwater samples to be analyzed as part of the quality control procedures. Trip Blanks are analyzed for the VOCs by EPA Method 8260B. Method Blanks are also analyzed by the laboratory to document any contamination that may occur as a result from the analytical process, as well as determine the precision and accuracy of the analytical method. Additionally, one duplicate sample is collected for the means of assessing quality control from the point of sample collection through the analytical process. The duplicate sample is discretely labeled and analyzed for the same parameters as the initial sample.

Related Projects/Client Information

Brief Description of Recent Landfill Projects

Closed Lincoln Landfill, Virginiatown Road, Lincoln CA: AEG worked on this Site from 1992 through 2015, conducting various tasks. During this time, AEG developed and implemented a corrective action plan, performed Geoprobe® investigation, performed a geophysical investigation, installed monitoring wells, conducted sampling, surveying, aquifer testing, engineering feasibility study, storm water monitoring, maintenance, and assisted the City with technical review. Additionally, AEG prepared semi-annual and annual monitoring reports documenting all work performed during the designated period. As part of the monitoring reports, AEG performed statistical analysis using Sanitas to determine trends across the Site. All work has been in accordance with City of Lincoln and Placer County regulations, and in compliance with Waste Discharge Requirement (WDRs) order number 91-059 and R5-2003-0142. Geotracker number: L10003287628.

Cost: Costs ranged from approximately \$58,000 (Well Installation and Reporting) to \$74,000 (Monitoring and Maintenance) per year. Contract values are as follows: Winterization Inspection and Report (\$1,487); Semi-Annual Monitoring (\$25,890); Semi-Annual Monitoring with Annual Report (\$27,165); Fire Break Mowing (\$11,000); Site Repairs (\$4,000); and Storm Water Monitoring and Reporting (\$4,329).

Current City Staff Reference: Ray Leftwich, P.E., City of Lincoln - City Engineer, 600 Sixth Street, Lincoln, CA 95648. Ph: 916.434.2470 Email: rleftwich@ci.lincoln.ca.us or rleftwich@lincolnca.gov

American Avenue Municipal Solid Waste Landfill, 18950 W. American Avenue, Kerman, CA: The American Avenue landfill is a 440 acre, active class III landfill, owned by Fresno County. AEG was awarded a five year contract with the County to be their consultant on this site in early 2012. The landfill consists of 23 monitoring wells, 11 leachate pumps, 7 pan lysimeters, and 17 suction lysimeters. AEG is responsible for writing reports based on field data collected by the County. The semi-annual and annual reports entail determining if a release has occurred, statistical analysis, developing figures showing the direction of groundwater flow and the gradient, and an in-depth discussion of the lysimeter data. The reports are in compliance with WDRs order number R5-2012-0064. Geotracker number: L10006109169.

Cost: Costs associated with Semi-Annual and Annual Reporting are approximately \$21,000 per year. Contract values are as follows: Semi-Annual Reporting (\$8,590) and Annual Reporting (\$12,285).

Reference: Curtis Larkin, Fresno County Department of Public Works and Planning - Resources Division, 2220 Tulare Street, 6th Floor, Fresno, CA 93721. Ph: 559.600.4259 Email: Clarkin@co.fresno.ca.us

Coalinga Solid Waste Disposal Landfill, 30825 Lost Hills Road, Coalinga, CA: The Coalinga landfill is a 120 acre, inactive class III landfill, owned by Fresno County. AEG was awarded a five year contract with the County to be their consultant on this site in early 2012. The landfill consists of 8 monitoring wells and 2 soil vapor monitoring points. AEG is responsible for writing reports based on field data collected by the County. The semi-annual and annual reports entail determining if a release has occurred, statistical analysis, and developing figures showing direction of groundwater flow and the gradient. The reports are in compliance with WDRs order number 5-00-233. Geotracker number: L10001009643

Cost: Costs associated with Semi-Annual and Annual Reporting are approximately \$11,600 per year. Contract values are as follows: Semi-Annual Reporting (\$4,330) and Annual Reporting (\$7,280).

Reference: Curtis Larkin, Fresno County Department of Public Works and Planning - Resources Division, 2220 Tulare Street, 6th Floor, Fresno, CA 93721. Ph: 559.600.4259 Email: Clarkin@co.fresno.ca.us

Related Project/Client Information

Individual Staff Experience and Project Organization

Key staff members and subcontractors on this project include the following:

Earl Stephens, PE, QSD (Principal Engineer)

This project for the City of Lincoln will be under the general direction and professional engineering license of Earl Stephens, Principal Engineer of Applied Engineering and Geology, Inc. All work will be reviewed and approved by Mr. Stephens prior to being submitted to the City for their review and approval. Mr. Stephens has been the Principal Engineer at AEG since 1990. He is a Registered Civil Engineer in both California (RCE 45335) and Nevada (RCE 12606) with over 30 years experience. Mr. Stephens has both a Bachelor of Science (1985) and Master of Science in Civil Engineering (1990), and his graduate level course work included extensive course work in geology and hydrogeology.

Mr. Stephens will be responsible for the overall corporate commitment, ensuring the resources are available to complete the project on time and within budget, and attending public meetings/hearings, when necessary.

Dane Frank, PE (Project Manager)

Mr. Frank is a Project Manager for AEG with a Bachelor of Science in Civil Engineering and is a Registered Civil Engineer (Colorado). Mr. Frank has been working with AEG for over nine years and has extensive knowledge of the environmental industry and its many facets, with a particular focus on Landfill Monitoring and Reporting, Environmental Feasibility Studies, Water Supply Studies, Geologic Studies, Aquifer Modeling, conducting Environmental Site Investigations, and Environmental Site Remediation Design and Installation.

Mr. Frank will be the main point of contact for the City, and intimately aware of all details including coordinating the projects, assigning tasks, tracking budgets, resolving unexpected conditions and costs, and providing quality control measures. Additionally, Mr. Frank will be responsible for maintaining smooth coordination and communication with the City, regulatory personnel, team members, subcontractors, and the public, when necessary.

Keegan George (Associate Engineer)

Mr. George is Vice President of AEG and will be an Associate Engineer on this project. Mr. George has a Bachelor of Science in Civil Engineering, and has been working with AEG since 2006. Mr. George has experience working on a variety of diverse environmental and water resources projects ranging from simple improvement projects and Phase I Environmental Site Assessments (ESAs) to more complex large-scale development and emergency projects. Mr. George will not only be responsible for overseeing strategic planning and problem resolution of the project, but will work closely with the Project Manager to assure quality control measures are implemented, and each phase of the project is completed on time, within budget, and to the satisfaction of the client.

Pace Analytical (Subcontractor)

Pace Analytical Services, Inc. will be a subcontractor to AEG for laboratory services on this project. Pace Analytical Services, Inc. has a local office in Davis, California and is a California Environmental Laboratory Accreditation Program certified laboratory that provides environmental testing services. AEG has teamed with Pace Analytical Services, Inc. on a variety of projects due to their fast turn-around times and consistently accurate results.

Organization Chart



AEG's Current Workload

AEG's workload is currently at approximately 50% of capacity, and has staff readily available to begin working on this project immediately. The Project Manager (Dane Frank) and Associate Engineer (Keegan George) are aware of all the intricate details associated with this project and are fully trained to carry out any tasks required to complete this project. If for any reason additional resources are necessary on this project, AEG has several part-time backup field staff members available with little notice. Due to our prior experience on this project and knowledge of the Site conditions, we are confident that AEG has the necessary resources to handle all requirements of this project, including any additional or contingency services in a timely manner.

Statement of Departure, Reassignment, or Substitution of Team Members

Prior to the departure, reassignment, or substitution of any named member of the designated project team including subcontractors, AEG will make a written request to the City for approval.

AEG's Cost Proposal

AEG's cost estimate of all required services and associated fees is included in the separate sealed envelope entitled Engineering Services Cost Proposal - Closed Lincoln Landfill Monitoring Project.

Exceptions

AEG has no objections or changes to the City's RFP.

Appendices

Appendix A - Resumes of Key Staff

Appendix A - Resumes of Key Staff

EARL R. STEPHENS, MSCE, PE

Years with AEG

1990 - Present

Experience

1985 - Present

Education

M.S., Civil Engineering,
California State University,
Long Beach

B.S., Civil Engineering
California State University,
San Diego

Registrations

Professional Civil Engineer,
California No. 45335

Professional Civil Engineer,
Nevada No. 012606

EXPERIENCE SUMMARY

Mr. Stephens, president of AEG, has been the principal engineer at AEG since 1990. He is a licensed civil engineer in both California and Nevada with over 30 years of experience. That experience includes all aspects of environmental site investigations, landfill investigations, groundwater source investigations, environmental site remediation design, UST removals, land development, and geotechnical site investigations, design and testing. These projects include developing new water supply and waste water disposal options for large Tribal casino, commercial, and residential projects. Mr. Stephens' graduate level education included extensive course work in geology and hydrogeology. Mr. Stephens has also been deposed and testified on behalf of our clients, presented data, and answered questions at public hearings.

SELECT EXPERIENCE

ENVIRONMENTAL SITE REMEDIATION DESIGNS: Oversee the installation of monitoring wells, infiltration galleries, cutoff trenches, pump and treat, air sparge/soil vapor extraction (AS/SVE), and groundwater oxygenation remedial systems. Design and implement remedial actions, both in-situ and ex-situ, for sites impacted with fuels, solvents, dry cleaning fluids, biological agents, agricultural wastes, and metals. Design air sparging/vapor extraction piping systems for soils impacted with hydrocarbons. Supervise the overexcavation of petroleum hydrocarbon impacted sites and use a PID to monitor conditions.

ENVIRONMENTAL INVESTIGATIONS: Conducted Phase I, II and III environmental assessments/impact statements, hazardous waste investigations and abatement, environmental surveys, and groundwater monitoring and reporting for a variety of projects ranging from simple gas station/brownfield lots to landfills, large scale development projects, and casino resorts.

GEOTECHNICAL SITE INVESTIGATIONS: Supervise, organize, and coordinate geotechnical site investigations; conduct field investigations and oversee drilling and sampling; determine sampling type, frequency, and associated testing requirements; prepare construction drawings and reports; and, oversee actual construction.

GROUNDWATER RESOURCES: Supervise, organize and coordinate the investigation of groundwater resources, including the siting, design and installation along with the testing of production and monitoring wells for water supply associated with large scale Tribal projects. Perform pumping tests, determine long-term yield, and evaluate impacts to surrounding sensitive targets (i.e. wells, surface water bodies, and springs).

RISK BASED HUMAN HEALTH EVALUATIONS: Perform Risk Based Corrective Action (RBCA) evaluations (a.k.a. Tier 2 Human Health Risk Assessments) for sites impacted with agricultural wastes, petroleum hydrocarbons, solvents, and metals in soil, soil vapor, and groundwater. Perform RBCA Evaluations both live (during field work) and after field activities were complete. Perform RBCA Evaluations using the computer model RISC to calculate the associated carcinogenic and hazard index risk to human health and the environment.

DANE L. FRANK, BSCE, PE

Years with AEG

2002 - 2004, 2009 - Present

Experience

2002 - Present

Education

B.S., Civil Engineering,
California Polytechnic State
University, San Luis Obispo

Registrations

Professional Civil Engineer,
Colorado No. 0050207

EXPERIENCE SUMMARY

Mr. Frank has nine years of experience in the environmental and water resources fields. This experience ranges from the investigation and remediation of contaminated water resources to water supply paper studies, water resources development, and water use planning. The types of activities Mr. Frank has performed in these fields range from those of a field technician (ex. collecting water samples), to design engineer (ex. design a new public water system), to project management of projects ranging from single domestic well installations to a water association project with a coverage area including roughly three quarters of Northern California. Mr. Frank's primary responsibilities at AEG are those of a project manager, which include: coordinating with clients, regulators, and the public; planning, scheduling, and logistics; budgeting; general oversight/management of projects; and performing complex technical tasks required to complete projects.

SELECT EXPERIENCE

ENVIRONMENTAL INVESTIGATIONS: Meet with clients and regulatory agencies (Regional Board, cities, counties, air boards, sewer districts, etc.); oversee field investigations and collection of samples for laboratory analysis; review evaluation of laboratory and field data; and reporting of activities in accordance with Waste Discharge Requirements (WDRs) and/or National Pollution Discharge Elimination System (NPDES) permits.

ENVIRONMENTAL SITE REMEDIATION DESIGNS: Design and implement remedial actions, both in-situ and ex-situ, for sites impacted with fuels, solvents, dry cleaning fluids, biological agents, agricultural wastes, and metals. Supervise the overexcavation of petroleum hydrocarbon impacted sites and use a PID to monitor conditions. Oversee the installation of monitoring wells, infiltration galleries, cutoff trenches, pump and treat, air sparge/soil vapor extraction (AS/SVE), and groundwater oxygenation remedial systems. Perform computer modeling to determine fate and transport of certain analytes and associated risks to human health and the environment.

SOIL, SOIL VAPOR, AND GROUNDWATER INVESTIGATION: Prepare workplans and drilling permit applications, secure utility clearance, oversee the installation of groundwater monitoring wells and direct push boreholes. Survey wells and sampling points. Perform and oversee the collection of soil, soil vapor, and water samples for laboratory analysis. Compile data and prepare the report of activities.

REMEDIAL SYSTEM DESIGN, INSTALL AND OPERATION AND MAINTENANCE: Design, install, and startup of soil, soil vapor and groundwater remedial systems. Perform routine operation and maintenance on the systems to keep them up and running and in compliance with WDRs and/or NPDES permits.

GEOTECHNICAL SITE INVESTIGATIONS: Organize, and coordinate geotechnical site investigations; conduct field investigations and oversee drilling and sampling; determine sampling type, frequency, and associated testing requirements; prepare construction drawings and reports; oversee actual construction.

Years with AEG

2006 - Present

Experience

2006 - Present

Education

B.S., Civil Engineering,
California State University,
Sacramento

Registrations

Engineer-in-Training,
Certificate No. 148289

EXPERIENCE SUMMARY

With over a decade of professional experience in the environmental consulting and engineering industries, Mr. George has managed a wide variety of diverse projects ranging from WDR compliance for Class II and III landfills, to landfill assessments and monitoring, industrial storm water permit management, environmental compliance and permitting, groundwater resource and hydrologic studies, and land development. Mr. George also has extensive background experience in environmental quality, environmental site investigations, and hazardous waste management. As Vice President of AEG, Mr. George's primary responsibilities are to ensure the company has adequate resources to complete projects on time, on budget, and at a level of quality that exceeds client expectations. Mr. George also manages a variety of his own projects where he is responsible for budgeting, scheduling, planning, conducting status meetings, general oversight/management, and the technical details of each project.

SELECT EXPERIENCE

ENVIRONMENTAL INVESTIGATIONS: Meet with clients and regulatory agencies (Regional Board, cities, counties, air boards, sewer districts, etc.); conduct and oversee field investigations; collect samples for laboratory analysis; evaluate laboratory and field data; and prepare reports of activities in accordance with Waste Discharge Requirements (WDRs) and National Pollution Discharge Elimination System (NPDES) permits.

SITE MONITORING AND REPORTING: Prepare equipment, supplies, and notifications for field sampling; collect groundwater and surface water data; purge and sample wells and surface water bodies; label and store samples in accordance with applicable rules and regulations; coordinate laboratory pickup and analysis; compile, tabulate and perform statistical analysis and hydraulic gradient calculations, and present data in report format per regulatory standards.

ENVIRONMENTAL SITE REMEDIATION DESIGNS: Design and implement remedial actions, both in-situ and ex-situ, for sites impacted with fuels, solvents, dry cleaning fluids, biological agents, agricultural wastes, and metals. Supervise the overexcavation of petroleum hydrocarbon impacted sites.

SOIL, SOIL VAPOR, AND GROUNDWATER INVESTIGATION: Oversee the installation of groundwater monitoring wells and direct push boreholes. Acquire permits and access agreements in order to perform necessary sampling. Collection of soil, soil vapor, and water samples for laboratory analysis. Compile data and prepare report of activity.

STORM WATER MONITORING: Prepare storm water pollution prevention plans (SWPPPs), implement/oversee installation of Best Management Practices (BMPs), perform storm water monitoring and inspections, and prepare annual storm water reports for both industrial and construction general storm water permits.